

# MOTOR AGE

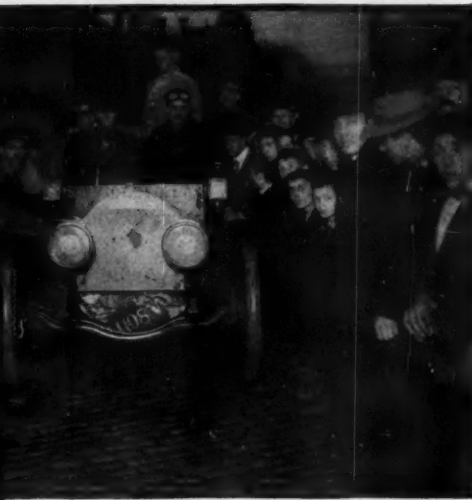
## NEW YORK'S ENDURANCE RUN A MUD PLUG



CARS LINED UP FOR THE START



MORA CAR NEAR CHATHAM



OFFICIALS' CAR AT THE FINISH

NEW YORK, June 11—A 1-day reproduction in miniature of the 4 days' battle through storm and mire known to motor history as the Pittsburg tour of 1903 best describes the 208.1-mile wallow of a new crop of mudlarks between this city and Albany by way of the Berkshire hills, which was the outcome of the endurance run of the New York Motor Club, held last Thursday. From 6 o'clock in the morning until well on toward midnight the contestants skidded and plowed through the mire and rain in an effort to maintain a schedule averaging  $18\frac{1}{2}$  miles an hour continuously during the eight controls, into which the course had been divided.

None succeeded, though a quartet of sturdy mudlarks managed to get through in times ranging from 9 to 24 minutes in the aggregate behind the schedule requirements. There were no perfect score ties about this run. To survive it was glory in itself without quibbling over any such small matters as technical point penalizations. As a matter of fact eighteen of the twenty-seven starters got in at Albany before 11 o'clock that night, the leading quartet above mentioned reaching the finish within half an hour

of the 6 o'clock set for the first car to arrive at the state capital.

The committee made public its report today. It awarded first prize in the touring car class to the 40-horsepower Lozier driven by H. Michener, which got through with a loss of but 18 minutes at controls, and the victory in the runabout division to H. W. Vanderbilt, who piloted a 30-horsepower Haynes with a loss of but

twenty points, two of them incurred by being a minute late at Albany. Both these cars had perfect mechanical scores.

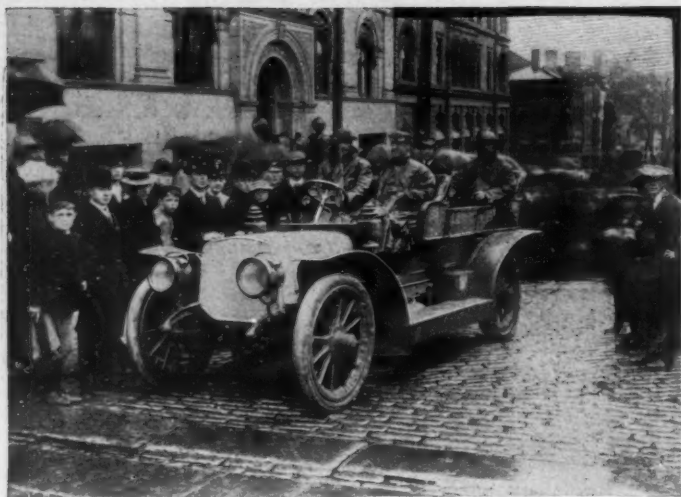
James Corbett—the mud-fighter, not the ring gladiator—drove a 24-horsepower Corbin touring car through with a perfect mechanical score and but 9 minutes' loss at controls. He was protested, however, for dropping under extenuating conditions of storm at Great Barrington his two passengers, a woman and her escort, and arriving at the finish with but three aboard. There was nothing left for the committee to do but disqualify the car, as the facts were indisputable.

In announcing the result the committee named eight cars, which had finished the run without adjustments or repairs, and added: "The remaining cars which finished received only minor penalties, which it is reasonable to assume might not have been necessary under normal touring conditions." The cars with mechanically perfect scores appear in the annexed table of results.

L. H. Perlman, of the Welch company, protested the Lozier, claiming it did not go the course, but later withdrew the protest. The newspapers printed a protest



WHEN CHAINS WERE BLESSINGS



LOZIER



TWO OF THE LEADING PERFORMERS

CORBIN

by A. G. Southworth on behalf of the Pope-Hartford, complaining of being penalized for time lost by tire repairs as the rules plainly demanded, as to which the committee—R. H. Johnston, A. G. Batchelder, Alfred Reeves and W. J. Morgan—has the following to say in its report:

"The committee has also seen in the newspapers what purports to be a protest from A. G. Southworth. As no such communication with the requisite fee of \$10 has been received by the committee, it would not have been necessary to take any cognizance of same except that it implies that the committee was not fair to No. 12 Pope-Hartford. In answer to this allegation, it is necessary only to point out that had the car in question adhered to its schedule it would have been due at Albany at 6:11. As a matter of fact it did not arrive until 8:22, which, obviously and unquestionably, entailed a penalty of 131 points, as the most superficial examination of the rules would show."

The success of the run from a competitive and test standpoint has aroused an opinion in the club favorable to making the test over this course an annual event. Some even favor its repetition by the New York Motor Club in the autumn.

The scoring was on the basis of a point

penalization for every minute late at controls, two points per minute for stops for repairs or adjustments, and one for each minute ahead of schedule at a control, tire repairs not to count in the mechanical score, but not to be allowed for in running time.

The time schedule for the run was not announced until just before the start and apparently did not take into consideration probable road conditions, being framed on the 20-mile-an-hour legal limit with an allowance for slowing down through towns. It follows:

Control	Miles	Time	Total miles	Total time
Cold Spring	28.1	1.30	52.7	2.55
Tarrytown	24.6	1.25	24.6	1.25
Poughkeepsie	23.1	1.15	75.8	4.10
Amenia	26.4	1.25	102.2	5.35
Great Barrington	32.6	1.40	134.8	7.15
Pittsfield	21.1	1.10	155.9	8.25
Chatham	28.0	1.30	183.9	9.55
Albany	24.2	1.25	208.1	11.20

The start was made promptly at 6 o'clock from Sixty-second street and Broadway, the cars being sent away at 1 minute intervals. Only two entries were missing—an American and a Pierce. An hour or more in advance the official cars were sent ahead—Carl Page to lay the confetti trail in a White steamer and Ben Richards to set out the checkers in a Packard Thirty. Both made whirlwind runs of it, the checkers declaring that Richards had given them the ride of their lives over the muddy roads. A Berliet, piloted by Dell Starr, followed and picked them up. The course lay up Broadway and out Lafayette boulevard and Riverdale around to Yonkers, thence out the Albany shore road to Poughkeepsie, whence the tourists bore away to the east to the Berkshire hills, then back to the Hudson and on to Albany. The trailer was a Berliet carrying a quintet of newspaper men. The scribes had hard luck at the outset in being pulled in by a motor cycle cop, who confessed to being disgruntled at being around so early to watch the motorists, and being delayed nearly an hour before a common sense sergeant and reasonable judge released them on parole.

The city and suburban boulevards passed the skidding and plowing through the leave-over mud began. It was not many miles out before tire troubles, which road conditions made abnormally frequent, commenced. The run to Tarrytown was a clean one. A quintet had suffered time penalizations at Cold Spring, but by the time Poughkeepsie was reached a dozen were numbered among the tardy ones.

It was bad going out of Poughkeepsie, followed by alternate stretches of not very bad, bad and frightful roads until the gasoline station at Amenia was reached. Here rain began to fall and the mud fight began in earnest. The route lay through the beautiful Housatonic valley. Despite the enshrouding mist and pouring rain the loveliness of the mountains and the picturesqueness of the valleys were hard to obscure. In fair weather the run would be ideal. The noonday stop was set for Great Barrington with luncheon on the veranda of the big Berkshire inn. Here the schedule called for a 40 minute stop and there were no kickers.

Now came the run through the Berkshire hills, past the magnificent estates lining the road to Pittsfield, through Stockbridge and Lenox. The committee had been warned that the state road was impass-



ROAD NEAR POUGHKEEPSIE



HAYNES, WINNER AMONG ROADSTERS





CONTROL AT GREAT BARRINGTON

sable, but welcomed the strenuosity it promised. It had, however, little knowledge of what the reality was. As a matter of fact, the road was being rebuilt from one end to the other. It was plowed up and was a morass of mud. Through it, however, the road buckers plunged up to the hubs. There were signs "Impassable" at intervals, but the tourists plugged straight on with an occasional deviation to a country by-road, when a barrier prevented further progress.

These switches off the roads were often two narrow for two vehicles to pass and cars were ditched through skidding or avoiding teams. By this time all hope of completing the run on schedule had been very generally abandoned. The contestants were good fellows and Samaritans and stopped to pull one another out. At times close to a half an hour would be lost in this way with as many as a dozen men in the extrication job.

From Pittsfield the course lay east in the

direction of the Hudson river, past the Shaker settlement at Lebanon. By the time Chatham was reached by the rear half division it was dark. Darkness was encountered by most of the advance guard long before Albany was sighted. And—whew!—what a drive that was through the mud over that unmarked maze of roads to Albany. Only one car, the Corbin, got through it unpenalized. How badly the others fared the score sheet will show.

A great crowd gathered at the Ten Eyck at Albany to greet the returning mud larks. By 8 o'clock the grill room was filled with rain-soaked, mud-bespattered motorists and there was a babel of experience-telling tongues.

An unfortunate incident of the run was the killing of Clarence McKenzie, of the Standard Brake Co., through the Corbin runabout, in which he was riding as a passenger, being hit at the dangerous Clinton Heights crossing outside of Albany by an express trolley. The driver, James Swan, and the observer were also injured.

#### CHICAGO'S BIG TEST

Chicago, June 12—It was the intention of the Chicago Motor Club to follow the example set by the New York Motor Club and lay out a 200-mile route for its reliability run June 28, but the course mapped out hardly will make the double century. The cars in class 1 will go about 146 miles and the big touring cars and roadsters will do 25 miles more. The run will start at Grant's monument, Lincoln park, run north to Waukegan, then go through Libertyville to Half Day, from there to McHenry, through Wauconda, and then to Elgin. Here the class 1 cars will return to Chicago by the Chicago-Elgin road, while



CONTROL AT PEEKSKILL

the others will go home by way of Aurora, an extra 25 miles. There will be four classes—No. 1 for cars listed under \$1,500; No. 2 for cars costing \$1,500 and not exceeding \$2,300; No. 3 for cars listing over \$2,300, and No. 4 for roadsters listing at \$1,500 and over. It will be a non-motor stop run, but the cars can be stopped if desired. There will be no controls, but checking stations at Waukegan, Half Day, McHenry, Elgin and Aurora. Bonnets and coilboxes will be sealed and penalties exacted if a seal is broken. It is permissible to take on gasoline and oil, but not water. Cars with oilers under the bonnet will be allowed to use auxiliary oilers. Cars with engines not beneath the hood must be fitted with aprons, so seals can be attached. An innovation is a team prize, which will go to the dealer who nominates three cars of the same make which have the least number of penalizations. However, he must declare before the run which three cars will represent him.

#### SCORE SHEET SHOWING RESULTS OF NEW YORK MOTOR CLUB'S RECENT ENDURANCE RUN

Car	Driver	H. P.	Touring car or runabout	Tarrytown, 24.6 miles	Cold Springs, 52.7 miles	Poughkeepsie, 75.8 miles	Amenia, 102.2 miles	Great Barrington	Pittsfield, 134.8 miles	Chatham, 155.9 miles	Albany, 182.9 miles	Time penalization, 208.1 miles	Mechanical score
James Corbett.....	Corbin	24	T	0	0	0	0	5	0	4	0	9	Perfect
H. Michener.....	Lozier	40	T	0	0	0	0	4	0	1	13	18	Perfect
C. B. Warren.....	Haynes	30	R	0	0	0	0	0	0	18	1	20	Perfect
E. L. De Camp.....	Welch	50	T	0	0	0	0	0	4	15	5	24	
R. L. Lockwood.....	Reo	16	T	0	0	0	0	0	0	17	29	46	
R. L. Newton.....	Stoddard-Dayton	35	R	0	0	4	0	0	2	26	18	50	Perfect
P. J. Johnson.....	Berlet	40	R	0	2	0	0	0	21	19	37	79	Perfect
E. W. Hudson.....	Mitchell	35	T	0	0	10	10	8	2	38	35	103	
C. C. Singer.....	Premier	24	R	0	0	8	24	0	10	0	54	106	
John Dower.....	Corbin	24	T	0	0	0	8	10	4	45	40	116	
Phil Hines.....	Pope-Hartford	25	T	0	0	0	33	0	0	12	86	131	Perfect
S. B. Stevens, Jr.....	Darracq	50	T	0	12	2	34	12	8	40	42	148	
S. Martin.....	Dragon	24	T	0	0	5	X	X	19	30	20	153	
C. S. Johnston.....	Continental	35	R	0	0	83	0	8	10	44	37	182	Perfect
W. I. Fickling.....	Stearns	30	R	0	0	46	0	20	17	31	56	201	
A. E. Dennison.....	Knox	25	T	0	0	0	8	0	19	58	137	222	
R. B. Mann.....	White	30	T	0	0	0	0	99	10	57	63	229	
H. H. Knepper.....	Fray-Miller	24	T	0	0	1	108	59	3	24	102	300	Perfect
John Haynes.....	Dragon	24	R	0	0	0	22	46	49	Out			
Ray Howard.....	Stoddard-Dayton	30	R	0	0	0	24	5	Out				
F. Cimlott.....	Mora	24	R	0	0	6	11	19	Out				
Joseph Judge.....	Pope-Toledo	50	T	0	0	0	0	Out					
J. C. McCafferty.....	Glide	40	T	0	0	Out							
R. G. Howell.....	Franklin	30	R	0	5	9	49	18	0	14	Out		
A. M. Robbins.....	Aerocar	40	T	0	0	0	0	0	0	34	Out		
Charles Fleming.....	Maxwell	16	T	0	5	24	Out						
James Swan.....	Corbin	24	R	0	0	0	0	0	0	16	Out		

— Behind schedule X Ahead of schedule +Incomplete

# ON THE EVE OF THE WORLD'S LARGEST RACE



ROAD NEAR GLASHUTTEN



DESCENT INTO ESCH



KAISERPREIS COURSE

BERLIN, June 1—The biggest road race in the world will be contested over the Taunus course June 14, when the pick of nations will contest for the emperor's cup. There were ninety-two entries made for this race but so unwieldy was the field that the emperor himself ordered an eliminating trial to reduce the list to forty cars. Therefore, the promoters ordered two heats which will be run June 13, when the twenty cars making the fastest times in each heat will qualify for the final the next day. In the trials the cars will go only twice around the course.

The Taunus circuit has not greatly changed since the 1904 Bennett. It still has the same characteristics as regards contour, but the race this time is different in that it is to be the reverse way, or in the direction of the hands of a clock go. It is only natural that with the money lavished on the circuit and in the preparations for this great event—an expense which has been estimated at \$100,000 at least—a circuit has been obtained and a surface retained on the roads which will permit of a truly great race to be held without the least suspicion of a grumble regarding the condition of the roads forming the course.

It may be interesting to compare the Taunus with some of the road racing courses of recent years. In the first place it is as unlike the Dieppe circuit of the French grand prix as the prairie is unlike the cañon country of Colorado. The Dieppe circuit, both as regards numbers of cars engaged and difficulties to be encountered, is child's play compared with the Taunus, with its interesting features at every few hundred yards. In the Dieppe circuit there are some fine long stretches of practically straight road and not once throughout the circuit is found any real sinuosity, while there are no hills of note in the Dieppe circuit which cause drivers to exclaim that they have never seen the like. This really can be said of the Taunus, which contains some ascents which even in the Auvergne would have been termed tremendous. The Dieppe circuit is

all clear going without any streets of houses narrowing the available space. On the Taunus course there are clusters of houses where the road can be termed a street and is so narrow that if a driver wishes he can bar the way to a swifter car following behind, and without any trouble. The two circuits will have one thing in common—that is, a good surface with a



STARTING POINT OF THE RACE

tarred top to hold the dust. The Dieppe circuit was chosen with a view to speed and speed only and is about the best specimen of a give-and-take road which was available in France for the purpose at the present time. The German emperor's cup race, however, is established for the standard series of light touring cars and

the bodies are the only things which are replaced by anything which is not standard, to-wit: the racing body. Even in this, however, certain restrictions have been made as regards dimensions. Evidently for the two kinds of cars two kinds of circuits are necessary. It is to be regretted that in the Taunus the obstructions cannot be removed and the narrow roads and hindrance to clear going cannot be altogether obviated. Compared with the Sarthe circuit of last year the Taunus is as difficult as the Sarthe was easy. The two have nothing in common. Perhaps the Taunus is more to be compared with the Ardennes circuit than with any, with perhaps a sprinkling of the turnings of the Targa-Florio circuit thrown in. There are some terrible turnings, too, on the Taunus circuit. Right from the start the cars have to negotiate the Saalburg and some double S climbs, to reach the town of Homburg. Again, from Dornholzhäuser to Obernasel, there are, so to speak, nothing but turnings. At Koenigstein there is a right-angle turn to avoid a height which is approached in Esch by a series of horseshoe turns. The route just about here is really so dangerous many drivers declare it no longer is dangerous in view of the care necessary in negotiating the difficulties. There is not 400 yards of straight line anywhere in this locality and at Rod-an-der-Weill are to be found two really terrible turnings, the first to the right, a sudden dip, then to the left and the road is once more parallel with the part just previous to the right-hand turning. Then the double S turnings recommence as the road rises until Weilburg is reached. The latter town is not touched. It is here that a famous hill commences from the Weil valley which has in places a 16 per cent grade, although the 18 per cent with which it is popularly accredited is probably an exaggeration. At all events few motor car drivers ever have seen anything similar in their driving days. It is literally climbing a staircase and the avoidance of the town of Weilburg is made by a means which may be worse than passing through



the town itself. The German organization, however, has its limits and it was thought the dangers of passing through the town were such that the lesser of two evils lay in the horrible climb just referred to.

An immense forest then is encountered with a wide and fine route, which, however, is difficult in its switchback nature. A curious point is the fact that most of its turnings are to be found on the hillsides. The turns are somewhat treacherous since the fine wide road leads the driver to suspect no evil. Those on the upgrade are especially fierce. Thus the competitors will arrive at Grauenwiesbach, after which comes another corkscrew rise, then a nice tableland, followed by a splendid straight line of a few miles to Usingen. From Weilburg to the grand stands the best speeds will be made but the remainder of the circuit must be taken with great care.

The critical point is Esch and the race may be won or lost at this spot. It will be impossible to pass throughout the length of this particular part of the road.

There are parts of the Taunus circuit which are wide, such as from the grand stands to Homburg. Perhaps it is 40 feet wide over this portion and good going, like a race track. From Homburg to Oberusel the road is a series of streets, about 10 miles in all and there is room for one car only to pass. Thence to Koenigstein it widens a little and from the latter town to Esch the road is all that could be desired as to surface, character and width. But it is terribly hard, for it is one continuous climb. It is preferable, however, to the new road from Esch to Weilburg, avoiding this latter town and also Limbourg. The road is a constant corkscrew with a steep mountain on one side, the mountain torrent on the other—quite a dangerous part, without anything to speak of in the way of roadside where a car en panne can place itself to avoid passing cars.

In any event the Taunus circuit is a terribly hard one for any car, but it is most interesting in view of the novel regulations under which the cars will run and also as regards the splendid organization which is evident from the moment the

competitors or spectators arrive within sight of the circuit. The Germans have given the world a lesson in organizing races—although it is their first official race. Perhaps the interest taken in the matter by royalty has a deal to do with this fact, since the future of a growing industry depends more than anything upon the patron-



WINDING STREET IN WEILBURG

age of those in high places, as is recognized elsewhere than in Germany.

A few words on the splendid organization of the kaiserpreis as the emperor's cup is termed, will show that the Germans are in the enviable position compared with their admirable neighbors in matters of this sort. In the first place, the spectators have been assigned certain well-defined positions along the race course and no one is permitted to occupy unauthorized places, where there might be danger to life of spectators or racers. Thus around curves there will be found nobody within 50 yards of the actual curve on either side, and the work of the drivers will be much simplified thereby. All inhabitants along the roads have been strictly enjoined to look

after their own personal belongings and domestic animals, as well as themselves and children. There has been a deal of thought expended as regards the manner of dealing with the populace on the great days of the eliminating and final race. From the various large centers special trains will be run, and the companies have to charge certain maximum fares for the journey. From the towns nearer the circuit the various means of conveyances have been provided with a tariff which leaves ample margin of profit while preventing impositions on the eager sightseer. Then again, all persons selling refreshments and all restaurants of the popular sort have been given to understand that special holiday prices are not allowed and tariffs for provisions and for victuals in general have been fixed according to the needs and facilities of the district. The same remark applies to grand stands erected in many places throughout the circuit.

The prices for the official grand stands where the emperor will view the race are as follows: The tribunes are installed not far from Saalburg at a place called Kloster Thon and a limited number of boxes with four places each are let for the second day of the race at about \$10 per seat. A complete box costs \$40 for the great day and half this figure for the eliminating race. In the covered stands the seats are numbered and entrance given by card, each card costing \$5. Sleeping accommodation in the neighboring towns has been handed over to the various local motor clubs, which let the rooms at a fair and uniform charge. No private letting will be allowed by the promoters of the race.

The grand stand where the emperor and suite are to be located is a most sumptuous affair and from the decorations and style almost remind one of the ancient tilting grounds and the headquarters of a Charlemagne, except that the knights in full armor are replaced by the snorting iron steeds driven by men with as much nerve and every bit as much disguised as were the knights of old. The battle is to be as hardly fought, even though more pacific means are used.



WINDING ROAD NEAR ESCH



COURSE THROUGH VALLEY NEAR REICHENBACH

## RACES IN WHICH FUEL WAS THE BIG FACTOR



GUINNESS ON HORSESHOE CURVE AT GLENCARN



HUMBER TAKING THE TURN ON THE HORSESHOE

LONDON, June 1—The third tourist trophy race has been won and lost and among other circumstances it is curious to note that the winner turned up in one of the identical cars that were unexpectedly refused admittance to the contest last year because they had reached the weighing-in enclosure a couple of minutes after the stipulated hour, while the second was the only other car to finish under the stipulated maximum time of 8 hours 45 minutes. As that time, however, had been fixed when the abnormal weather conditions which prevailed were not contemplated it is quite on the cards that it would not have been enforced had another car presented itself. But no other did, for all the rest ran out of fuel or were incapacitated.

The conditions of the race had been altered from the previous year in that no limit of weight was insisted upon for the chassis, while the load carried by it was raised by 275 pounds, the fuel allowance being maintained at the old level of 1 gallon for each 25 miles of road. Other modifications tended to bring the event more into accordance with ordinary standard practice, but for all that the entries showed a very serious declension. There were originally thirty-one, but only twenty-two started, one car being ruled out by arriving late at the weighing enclosure. The preliminary tests had been modified from original intentions because it was found that on the test hill chosen as one of six quite a large number of the competitors in the tourist trophy and heavy touring car races could not reascend after being brought to rest about the middle of the hill. The new hill prescribed no difficulties and all the cars got up quite comfortably. The slow speed test on the level was also negotiated, but a couple of cars had to take a second shot.

The morning of the race broke in a dismal drizzle which only ceased in order to become a positive downpour. It had been raining all night and the whole course—which had been treated with a patent dust-laying solution—was swimming with water. Under these conditions it was considered advisable to cut out two of the seven projected rounds for the heavy touring car race and to increase the gasoline allowance by another gallon and 5 ounces, reducing the mileage to about 205 miles and the final allowance to about 14 miles to the gallon. This for a load of over 2 tons on sodden and very hilly roads was a fairly severe test. The tourist trophy competitors, however, had to cover their full distance of 241 miles 5 furlongs 140 yards on an equivalent to 25 miles to the gallon. They probably had a trifle more, for when the gasoline was measured out the thermometer stood at 55 degrees instead of the official 60. At the start there was some wind, but it died away and the whole contest was carried through in an atmosphere loaded with drifting rain.

The beginning was very quiet. Some of the drivers delayed throwing in their clutches until their cars had sufficient momentum to start the engine, the start being down hill to Quarter bridge, where a nasty right-angled turn had to be taken

over a small bridge. But all got going fairly and actually completed the first circuit. It was then seen that No. 24, the Hillman-Coatalen car, had got well in front, but it was equally obvious that the car could not finish at the pace. Indeed, almost as it completed its first round it got its quietus, for it struck Quarter bridge, damaged a wheel, and though it completed another lap still in front, it then retired. Thereafter the race was a triangular duel for five rounds between the No. 2, Darracq, driven by A. Lee Guinness; No. 13, Beeston-Humber, driven by J. Reid; No. 22, Rover, driven by E. Courtis, and No. 9, Metallurgique, driven by O. Cüpper. There were others in the game in the earlier rounds, as the time table will show, but when the last lap arrived only eleven cars had got so far and three of these were then stopped. The other eight looked like making a great race if the fuel held out, and the Metallurgique, Humber, Darracq and Rover all passed the judges within 7 minutes. The Humber had done most of the leading but had a mishap in the fifth round and the Metallurgique went ahead. But it ran out of gasoline at Peel, 15 miles away. Then the Darracq got ahead and actually led by 7 minutes 3 miles from the finish, but it also ran out of fuel, and the Rover, whose rounds had been consistently running in and about the 30-mile mark most of the way, got up and rolled home an easy winner from the Humber. The winner had 28 ounces of fuel left in its tank, but the Humber only had enough to get home, the return showing that only the carburetor contained any spirit. All the others were stranded at various parts of the route.

Meanwhile the heavy tourist trophy race was run off, the cars starting immediately after the trophy competitors. At first the



HUMBER PLOWING MUD AT HILLSBURG



No. 6 Ascot Simplex took the lead, but it ran dry at the end of four laps and G. P. Mills, Beeston-Humber, who was 20 years ago a famous long-distance cycle road racer, drove in with over a gallon of fuel to spare, the Gladiator having almost a gallon and a half. One can well imagine the excitement the contestants were laboring under those last few miles. The uncertainty regarding the quantity of gasoline left in the tanks when the last sprint started must have been wearing on the nerves. None of the survivors knew just when they would run dry and lose just when victory seemed certain. The Rolls-Royce, winner of last year's tourist trophy, did not defend its title in this year's race.

### DENY SLIGHTING RACE

New York, June 10—American Automobile Association officials here are indignant at any imputation that they have at all slighted the proposed stock car contest or the rules submitted by the special committee. The Vanderbilt cup race course problem, which was sprung on them by the inability of the Long Island parkway promoters to furnish a route as expected, naturally monopolized attention at the meeting in question. Until a course of some kind could be obtained discussion of the stock car race, much less an announcement of the rules for it, was deemed impracticable and rather premature. The A. A. A. sent representatives of its executive committee to the Indianapolis meeting to discuss rules and claims to be as much interested in the promotion of a



INSPECTING CARS AT STARTING POINT

stock car race as the makers themselves. Before departing for Europe Chairman Thompson wrote H. O. Smith asking him as to the chance of securing in the west a course for such a contest. The racing board is keeping very quiet about its plans for securing a course for the Vanderbilt race and military policing of the contest until the legislature adjourns, fearing hostile legislation at Albany.

### SEATTLE'S 2 DAYS OF SPORT

Seattle, Wash., June 1—Seattle has had 2 days of motor doings, but a portion of this only can be chronicled as successful. The race meet at the track at the Meadows was a failure largely because of poor arrangements. The people here evidently took the greatest interest in the races, as the attendance the first day was 5,000. The racing on the second day was of a higher class, but the crowd was then much smaller owing to the fizzle of the first day. The parade of the morning of Memorial day was participated in by 200 cars. This

was the greatest turnout of its kind in the Pacific northwest. The parade was headed by one of the large sight-seeing cars with a band. Prizes were awarded as follows: First prize for the best decorated machine to Mrs. Josephine North, in an Oldsmobile. This car was decorated in national colors. Second prize to G. W. Miller, driving a white Winton decorated with red and white roses and with Teddy bears much in evidence. Third prize to Jonathan Gifford. White roses, white streamers of ribbon and a setting of greenery made

this one of the most striking cars in the parade. Mrs. M. Baker and Mrs. J. Froom carried off the honors for electrics driven by women. The car was a Babcock decorated with white roses, ivy and Scotch broom. Mrs. Garrett Fisher took the prize for gasoline cars driven by women, her car being a two-cylinder Rambler with decorations of flowers and ribbons. H. Grimshaw took the prize for the most novel decoration effect, his scheme being simply a sedate brown dog wearing a pair of goggles. Among the winners in the track races were a 30-horsepower Cadillac and a Thomas Flyer.

### MINNEAPOLIS TO HAVE MEET

Minneapolis, Minn., June 11—Arrangements are being completed by the Minneapolis and St. Paul clubs for the holding of a racing meet June 28 and 29 at the state fair track at Hamline, midway between St. Paul and Minneapolis. H. W. Pickens will furnish drivers for the contests. A feature will be a 24-hour race.

### STATISTICAL DETAILS OF ISLE OF MAN CONTESTS—THE HEAVY TOURING CAR RACE

No.	Car	H. P.	Lap times					Total time	Average speed
			1st round	2d round	3d round	4th round	5th round		
			H. M. S.	H. M. S.	H. M. S.	H. M. S.	H. M. S.	H. M. S.	M. P. H.
1	Straker-Squire	25-30	1:49:09	1:46:23	1:49:12	2:01:33			
2	Berliet	40	1:22:14	1:21:56	1:26:22	1:40:32			
4	Thornycroft	30	1:47:00	1:49:01	1:38:42	1:39:54			
5	Gladiator	25	1:25:39	1:36:54	1:32:04	1:30:05	1:26:51	7:31:35	26.7
6	Ariel-Simplex	30	1:13:59	1:35:38	1:12:00	1:13:53			
8	Arrol-Johnston	40	Retired						
10	Beeston Humber	20-30	1:20:05	1:20:46	1:31:24				
12	Ariel-Simplex	30	1:14:18	1:15:27	1:56:43	1:15:47			
14	Beeston Humber	30	1:29:32	1:24:39	1:24:37	1:25:18	1:16:54	7:11:00	28.7

### TOURIST TROPHY RACE—RECORDS OF CONTESTING CARS

No.	Car	H. P.	Lap times					Total time	Average speed
			1st round	2d round	3d round	4th round	5th round		
			H. M. S.	H. M. S.	H. M. S.	H. M. S.	H. M. S.	H. M. S.	M. P. H.
2	Darracq	18	1:20:22	1:20:30	1:23:20	1:25:50	1:14:54		
3	Darracq	18	1:27:34	1:24:52	Retired				
4	Berliet	22	1:25:35	1:47:27	1:27:32	1:30:52	Retired		
5	Berliet	22							
7	Arrol-Johnston	25	1:18:07	1:13:08	1:13:05	2:14:18	1:14:44	Retired	
8	Arrol-Johnston	25	1:40:29	1:19:15	1:18:47	1:19:18	1:19:31	Retired	
9	Métallurgique	24-28	1:19:05	1:15:55	1:19:39	1:23:35	1:33:04	Retired	
10	Thornycroft	14	1:40:54	1:21:46	1:23:03	1:23:35	1:40:01	Retired	
11	Scout	17-20	1:55:41	1:52:40	Retired				
12	Coventry Humber	16-20	1:20:08	1:17:29	1:19:23	1:20:25			
13	Beeston Humber	16-20	1:13:52	1:11:29	1:16:22	1:15:46	1:54:40	1:37:57	8:35:17
14	Star	18	1:26:18	1:26:57	1:37:22	1:55:15	1:46:52	Stopped	
15	Star	18	1:25:36	Retired					
16	West-Aster	16-20	1:26:11	1:26:24	Retired				
19	Vulcan	20	1:32:15	1:32:39	1:46:06	1:24:06	1:37:28	Stopped	
20	Bayard	18	1:30:21	1:28:16	1:32:39	1:35:45	1:33:29	Retired	
21	Gladiator	18	1:31:01	1:32:05	1:34:13	1:38:02	1:42:33	Stopped	
22	Rover	20	1:22:25	1:21:46	1:20:58	1:23:00	1:27:25	1:27:50	8:23:27
23	West-Aster	16-20	1:27:46	2:42:29	Retired				
24	Hillman-Coatalen	20	1:04:39	1:24:15	Retired				
25	Rover	20	1:50:21	1:26:04	2:02:40	1:37:44	Stopped		
28	Vlnot	24	1:16:53	1:25:09	1:18:06	1:18:53	Retired		

## LONG ISLAND EVENT RUN OVER

### Ten Cars Tied with Perfect Scores Try Again, Eight of Them Surviving a 186-Mile Trip—Jersey May Have Climb—Track Meet at Washington—Other Contests

Brooklyn, N. Y., June 10—An abortive attempt so far as the result went was made today to break the ten ties which were the outcome of the Decoration day endurance run of the Long Island Automobile Club. The ten cars were sent over a 186-mile course and eight of them evolved with perfect scores as follows: Class A, 15 miles an hour: Jasper D. Rourke, 10-horsepower Cadillac; J. I. Kirkham, 18-horsepower Maxwell. Class B, 18 miles an hour: E. H. Barnum, 24-horsepower Barnum; C. G. Arnold, 25-horsepower Pope-Hartford. Class C, 20 miles an hour: R. G. Kelsey, 40-horsepower Matheson; S. H. Burns, 30-horsepower Packard; E. R. Strong, 40-horsepower Pierce; C. A. Carlson, 40-horsepower Winton. Of the eliminated cars the Oldsmobile had got some oil in its commutator and the Pope-Toledo had replaced a dirty spark plug. The names of the cars will be put on the cups as there will be no further attempt at a run over.

#### May Have Jersey Climb

New York, June 10—W. J. Morgan has been scouring New Jersey for the past fortnight in search of a hill and thinks the road up Schooley's mountain in Morris county, between German valley and Hackensack, will do for a climb. The climb starts from the latter village and is about 2 miles in length. It is the heaviest climb in New Jersey. It has three sharp turns, one of which is a right angle. The road is well supplied with water-breaks, which, however, will be somewhat modified by filling in if a climb is given there. The grade averages close to 20 per cent and after looking it over Morgan decided to call it "the Jersey terror." Indications point to Morgan's soon sending out entry blanks for a climb on the Fourth of July.

#### Elks Run Motor Meet

Washington, D. C., June 8—A feature of the 2 days' carnival of the Washington Lodge of Elks at the Benning racetrack was the motor car races yesterday, which attracted a large crowd and added many dollars to the Elks' building fund. The sport opened with a 5-mile event for gasoline cars listing at \$1,250 and under, which was won by Sam Luttrell in a two-cylinder 22-horsepower Buick in 8 minutes 2 seconds. C. E. Miller, in a 15-horsepower Ford, was second, and H. Hackett, 35-40-horsepower Columbia, third. The 10-mile event for cars listing at \$3,000 and under, with full equipment, for Elks only, was interesting from the start. There were four starters, T. E. Miller, Adolph Loehl and E. H. Neumeyer, each in a 24-horsepower Columbia, and Charles Stohlman in

a 22-horsepower Buick. Miller took the lead at the start and was never headed, winning by many lengths in 16 minutes 5 seconds. Neumeyer was second. Three cars started in the 25-mile event for 60-horsepower cars and under—W. C. Hood, 60-horsepower Thomas; J. A. Lutz, 35-40-horsepower Oldsmobile, and Jack Conway, 40-horsepower Ford. Hood had no difficulty in winning, covering the distance in 32 minutes 9 seconds. Lutz and Conway both had troubles, but the former managed to finish, while Conway had to retire at the fifteenth mile.

#### Climb at Kansas City

Kansas City, Mo., June 8—The Decoration day hill climb of the Automobile Club of Kansas City was held under a sky which threatened rain at every turn of the wheels. Just at the close of the last event the sun made its appearance, and with it came the resolve to make the climb an annual affair. Well managed by club officials, the race furnished some good sport in all of its six events, which were run off with but two slight accidents. The course was the cliff drive, closed to motorists a great part of the time by the park board. It is a boulevard, paved with fine macadam. The full course was 8/10-mile. To each eighth of the distance there was a curve, not a single one of the number being easy to negotiate. The steepest grade was not above 12 per cent. The only two unlucky incidents of the day were accidents to F. S. Duesenberg and J. H. Wittman. The former came to grief in the last event, when a rear tire burst after half the course had been covered. The car, a Mason, veered sharply toward the right, the side on which was the disabled tire, ran up a steep bank, turned a somersault and fell back into the road. Duesenberg fell clear. Otherwise he might have been seriously hurt, for the steering wheel broke until the sharp control levers hung free. In the accident a front wheel gave way. Wittman had a similar experience with a tire and crashed from the second turn into a lamp-post, which arrested his flight and prevented the car from falling into a small lake close to the road. Outside of a bent fender and a front tire which gave way in the collision there was no damage either to the Pope-Hartford or the driver. A. C. Webb, who made the fastest time of the day, 1:35 $\frac{1}{4}$ , in an Oldsmobile, could not break this record in a later attempt. The many turns in the course put the smaller cars on the same footing with the larger ones, for the skidding on the turns was heavy and they could not be taken at high speed. In fact, some of the cars had

to coast around the most severe ones. The runabout class, \$1,500 and under, was won by F. S. Duesenberg in a 24-horsepower two-cylinder Mason in 1 minute 49 seconds. A 24-horsepower Mason, with the same driver up, won the climb for touring cars \$1,500 and under in 1 minute 50 $\frac{1}{4}$  seconds. A. C. Webb, in a 35-horsepower Oldsmobile, took the \$1,500-\$3,000 runabout class in 1 minute 35 $\frac{1}{4}$  seconds; A. O. Brooks, 35-horsepower Stoddard-Dayton, the \$1,500-\$3,000 touring car class in 1 minute 38 $\frac{1}{2}$  seconds; A. O. Brooks, 60-horsepower Welch, the \$3,000-\$6,000 touring car class in 1 minute 39 $\frac{1}{2}$  seconds; while the free-for-all went to A. C. Webb in the 35-horsepower Oldsmobile.

#### Sealed Bonnet Route Changed

New York, June 10—The Automobile Club of America has decided to change the routes of its sealed bonnet contest scheduled for June 19-22. The revised routes include only stone roads and are as follows: First day, 150-mile run over Long Island roads, starting at Long Island City; second day, 150-mile run over State road through White Plains, Mount Kisco, Bedford and Cross River to Danbury, Conn., and return; third day, 150 miles via the Shore road to New Haven and return; fourth day, 150 miles, a repetition of the 150-mile run on Long Island stone roads. On account of this change of route the committee has extended the date for receiving entries to June 15. Entries so far received include in class A for stock cars selling at and above \$3,000, a Berliet, a Thomas Flyer, a Pierce Great Arrow, two Loziers, three Locomobiles and a Stearns. In class B, \$1,500 to \$3,000, a Glide, an Elmore, three Locomobiles and two Stoddard-Daytons are named.

#### Cleveland Climb Postponed

Cleveland, O., June 10—The Cleveland Automobile Club is playing in very hard luck for its annual hill-climbing contest. Originally it was announced for Decoration day but later it was decided to postpone it in order to secure entries from cars which might participate in other events on that date. Last Saturday was the date selected. The club spent several hundred dollars in improving Gates Mills hill, widening the base, banking the turns and surfacing the entire ascent. A fine entry list of more than sixty cars was secured and the club obtained the consent of the authorities to use the hill several days in advance of the event. Suddenly, with only a day or so of warning, the authorities, acting under protests of some of the property owners along the hill, withdrew their consents, not only for preliminary trials, but for the big event itself. The disagreeable part of it is that the people living along the hill are not farmers from whom such protests might be expected, but they are wealthy city people, many of them car owners. After trying in vain to induce the dissatisfied ones to withdraw their con-



sents, the committee reluctantly decided to postpone the event. The committee has not yet reached a definite decision as to the time and place for the event but if possible it will be carried off June 15. Several localities have been heard from where residents are not only willing but desirous of securing the event but they are at some distance from Cleveland. The great difficulty now is to secure a hill which is in good condition as it has been raining almost constantly for the past week, making it difficult to secure a good surface. There is no thought of giving up the event, however, as the entry list is not only a large one but it includes many cars which already have been shipped from a distance.

#### Records for the Thomas

Denver, Colo., June 6—Not only was a new world's track record for 50 miles established at Overland park last Saturday, but a new record for a 5-mile run also was marked up. These things were accomplished by E. Linn Mathewson, president of the Mathewson Automobile Co., of this city, in a Thomas Forty. His time for the 50 miles was 55 minutes 43% seconds, an average per mile of 1:06%. At the end of the 45 miles his time was 50 minutes 59 seconds. The last 5 miles were run in 4 minutes 42% seconds, showing an average of 56% seconds per mile. Barney Oldfield made a single mile in 56 seconds on the same track a few years ago. Invited by an ideal Colorado day, over 5,000 people witnessed the races. The Thomas Flyer won two of the other races and a Thomas Forty and Stevens-Duryea one each. Tobin in the Oldsmobile was obliged to quit in the second mile of the 5-mile race for cars \$3,000 and under because of water getting in his gasoline tank. Summaries:

Five-mile race for stripped stock touring cars—Mathewson, Thomas Forty, won; time, 5:57. Maxwell, 20-horsepower Stevens-Duryea, second; time, 6:10. Brinker, 60-horsepower Thomas Flyer, third; time, 7:07. Powell, 25-horsepower Pope-Hartford; time, 7:15.

Five-mile for gasoline cars with tonneau, to carry four—Maxwell, 50-horsepower Stevens-Duryea, won; time, 6:21. Powell, 25-horsepower Pope-Hartford, second; time, 7:01.

Five-mile, for gasoline cars selling for \$3,000 and under—Brinker, 60-horsepower Thomas Flyer, won; time, 5:53%. Mathewson, Thomas Forty, second; time, 6:14. Powell, Pope-Hartford, third; time, 6:39. Tobin, Oldsmobile, dropped out in second mile.

Ten-mile handicap, all classes—Brinker, Thomas Flyer, won; time, 12:15. Mathewson, Thomas Forty, second; time, 12:23. Erlenborn, 35-horsepower Oldsmobile, third; time, 13:16. Tobin, Oldsmobile, out in fifth lap.

#### Climb at Harrisburg

Harrisburg, Pa., June 10—The youthful but energetic Motor Club of Harrisburg is preparing for its first annual hill-climb, to be held on the Fourth of July on one of three courses which are now being considered by the contest committee. Besides a motor cycle event and two others—touring car and runabout—open only to Harrisburgers, there will be a free-for-all, and four events for stock cars, \$1,000 and under \$2,500 and under, \$4,000 and under and \$6,000 and under.

## OUTINGS FOR ORPHANS

### Chicago, New York and Other Cities Join in National Celebration and Entertain Kids

Many of the principal cities in the United States paid heed to the request of the American Automobile Association and observed the national orphans' day. Some of the cities found it impossible to hold their outings on Wednesday, but the little ones were not forgotten. Several towns already have given the little ones their rides, while others intend doing so later.

Chicago, June 12—Had the weather been pleasant Chicago would have had 250 cars in line for orphans' day. But there was a few showers, which scared out some of the owners, while in several instances the managements of the asylums refused to let the little ones go because of the weather conditions. However, 101 cars, just three fewer than were out a year ago, lined up at 2 o'clock this afternoon, went over the south side boulevards and wound up at White City, where the youngsters had a repetition of the good time they enjoyed a year ago. It had been intended to take out the aged persons in the various homes, but lack of cars prevented this, and the old people will get their rides later on. The little ones were well looked after by the motorists. They had peanuts, cracker-jack and candy, and the cars were decorated with flags, and at White City they were gorged with other good things. Five motoring organizations took part in the affair—the Chicago Automobile Club, the Chicago Motor Club, the Chicago Automobile Trade Association, the Chicago Women's Motor Club and the Austin Automobile Club. Joseph F. Gunther acted as master of ceremonies, assisted by Walter L. Githens and several other dealers.

New York, June 12—Greater New York had ideal weather in its dual celebration of orphans' days, Manhattan children being looked after by the New York Motor Club, and Brooklyn little ones being cared for by the Long Island Automobile Club. New York had 150 cars, carrying 1,200, and Brooklyn 131 machines, bearing 800. The former were the guests of Dreamland and the latter were entertained at Luna park. The George N. Pierce Co. and the Harrolds Motor Car Co. gave the Dreamland dinner and the Long Island Club provided the Luna park luncheon. There was momentary crowding and an incipient race in prospect by part of the New York contingent, which the police, however, quickly quelled, compelling the drivers to observe single file down the ocean parkway to the terminus at Coney Island.

Pittsburg, Pa., June 11.—The third annual orphans' day has been set for June 27, and promises to be a very successful event. Responses already received from

the institutions of Pittsburg and Allegheny indicate that over 600 children probably will enjoy the outing. About 125 cars will be needed and over fifty have been offered already. Only two institutions will not avail themselves of the invitation. These are the home for crippled children, the children of which will be at the Lillian home at that time, and the Protestant boys' home, whose boys are all employed.

#### DETROIT'S BIG TEST

Detroit, Mich., June 10—With favorable weather on Saturday, June 15, the Automobile Club of Detroit is expecting to stage by all odds the most important and impressive motor event ever run in Michigan, the occasion being the second annual reliability run of the club. The cars will start at intervals from the Hotel Cadillac in Detroit, the first one getting away at 7 a. m. The course lies through Ypsilanti, Saline, Ann Arbor, South Lyons, New Hudson, Farmington and Orchard Lake to the club's home on Pine Lake, 20 miles from the city. Controls have been established and elaborate checking arrangements adopted. The competition is to be in three classes, the first and largest to include cars costing \$3,000 and over, the second of those costing from \$1,500 to \$3,000, and the third all cars costing less than \$1,500. The entrants must be members of the club and must either do their own driving or submit this duty to a member of their family. All bonnets must be sealed and any repairs other than to tires will result in complete disqualification. The schedule has been laid out with close attention to the legal speed limit and contestants will have a leeway of 1 minute either way from the appointed time at which they are due to pass each control. Edwin S. George, now president of the Michigan State Automobile Association, won the event last year in a Packard runabout.

#### ANOTHER 24 PLANNED

Philadelphia, June 9—So successful was the recent 24-hour race on the Point Breeze track, Philadelphia, that another similar event has been scheduled for June 28-29, this time under the auspices of the Quaker City Motor Club. Besides the big event there will be a 5-mile club championship, open only to members; 5-mile city championship, open to gasoline cars costing \$3,000 or less; 5-mile, open, and 10-mile city championship, open to all makes of stock cars. The track has not yet been decided upon, although the choice lies between Point Breeze and Belmont.

#### CHRISTIE FINISHES TRAINING

New York, June 11—Walter Christie gave the final try-out yesterday to his 130-horsepower direct-drive racer before his departure with it for Europe tomorrow for the grand prix contest on July 2, on the Hempstead road, where he has been camping with it for the past month.

## MERCEDES HERKOMER WINNER

### Edgar Ladenburg of Munich, Who Captured German Tour in 1905, Repeats His Success This Year by Defeating Brilliant Field Made Up of 161 Contestants

New York, June 12—Special telegram—Cable advices from Germany today give the result of the third annual tour for the Herkomer trophy which came to an end yesterday after a trip over 1,152 miles of German roads which began at Dresden June 5 and wound up at Frankfurt. One hundred and sixty-one cars started and the winner turned up in Edgar Ladenburg, of Munich, who drove one of the seventeen Mercedes cars in the test. This victory of Ladenburg's probably will settle the disposition of the cup. It had been expected that as this was the last Herkomer tour it would be necessary to have the three winners settle it among themselves, but as Ladenburg also won it in 1905 it is thought the trophy will go to him. Dr. Rudolf Stoss, of Zwickau, won last year in an 18-horsepower Horch and in that event Ladenburg was eighth in the final reckoning, showing remarkable consistency in running inasmuch as it was asserted that last year's rules greatly favored the low-powered cars and Ladenburg always has driven a 70-horsepower Mercedes.

Berlin, June 1—The third annual Herkomer tour has been organized by the Imperial German Club and the Bavarian A. C. The gathering of nearly 200 cars of all nations proves its international interest. It differs in some respects from other events of a motor nature, for, although motor cars of all kinds are admitted, they have to be of a type which is now pretty well everywhere adopted as the standard of comfort and engineering skill. More than ever this regulation has been brought to the fore during the present year. Motor cars with a cylinder capacity of between 2.5 and 11 liters are admitted, but each car must have four upholstered seats, a bonnet, mudguards for all wheels, two headlights, one rear lamp, two brakes and a muffler; also a reverse and a security device for use on grades. A comfortable step for getting into the car is exacted, and the space between the front and rear seats must be closed by a rigid construction. The upholstery work shall be in place and the car painted. In a word, up-to-date tourist cars only are allowed to enter and the cylinder capacity is such that cars of over 70 horsepower cannot come into the category. The fuel known as benzine in Germany is only allowed to be used and of a density of 680 degrees. No other essence is allowed. The entrance fee of \$90 includes \$15 for insurance of the car. If fewer than sixty cars had been entered the tour would not have taken place, but instead there were three times that number nominated

The points for and against competitors are calculated as follows:

For every involuntary halt of a minute, caused by the motor or one of the parts of the car, one point debited.

For every change or repairs to tires, even if done during the free time allowed for this purpose, five points debited.

For every addition of cooling water after the start of the cars, three points debited.

For time taken in repairs or preparations outside of the free time allowed for this purpose, three points debited.

For arriving too late at any daily start, one point debited.

Three-quarters of an hour is allowed each car as free time before each daily start for the execution of any repairs to motor or car, except renewals of tires.

The race through the Forstenrieder park and over the Kesselberg is such that if the car does not attain or exceed the speed considered normal for its class one-tenth of a point will be debited or credited as the case may be. If two or more cars finish the tour with the same number of points the hill-climbing test is considered decisive. Any car with more than fifty points debited in the tour will be excluded from the speed race and hill-climbing competition. The winner of the tour is the car which has the fewest points against it. The cylinder capacity of the car will be measured a second time before prizes are announced.

In previous tours regulations were inefficient because of the trouble in enforcing them; in fact it was more difficult for the committee to control the cars than for the competitors to evade the rules. This year the regulations are considered to be rigorous enough and as complicated as need be for such an event. A new regulation consists of the exclusion of cars not provided with finished bodies or with rigid sides between front and rear seats. Of course side-entrance cars are included in this category, in fact side entrances are insisted upon. Another addition to last year's exactions is that the cars must have four comfortable seats, protected against the weather and the car must be painted. The drivers must give a report to the controller aboard each car every time a halt is made during the daily runs. A committee of five has been appointed to see that the cars presented for the race are in accordance with the foregoing regulations.

Another committee of five is appointed to decide on the aesthetic appearance of the cars for what is termed the beauty competition. In the beauty competition twenty of the eighty points are given for quality, appearance and painting,

fifty points for the character of the upholstering work, ten points for the lanterns, forty for the protection devices against rain, dust, wind, etc., forty for the arrangement of tools, forty for the distribution of baggage and thirty for other accessories. This competition is of course apart from the actual results of the race and does not interfere in any way with other prizes offered. The car which has the most number of points and finished the race in good condition will receive the beauty prize. In case of a tie then the speed race will settle the matter.

As the Herkomer tour will not, in any event, have been won by the same man three consecutive years, the trophy will be drawn for by the three winners. The official program of the tour is as follows:

June 4—Lineup of the cars, in Dresden.  
June 5—Start 6 a. m. Dresden, Chemnitz, Zwickau, Leipzig, Naumburg, Weimar, Eisenach; 365 km.  
June 6—Start 7 a. m. Eisenach, Meiningen, Kissingen, Würzburg, Wertheim, Auerbach, Erbach, Heidelberg, Mannheim; 335 km.  
June 7—Start 5 a. m. Mannheim, Karlsruhe, Achern, Oppenau, Kniebispass, Freudenstadt, Horb, Sulz, Rottweil, Tuttlingen, Ludwigshafen, Lindau; 365.1 km.  
June 8—Start 7 a. m. Lindau, Immenstadt, Kempten, Füssen, Weilmünster, Starnberg, Forstner Park, Munich; 227 km.  
June 9—Rest.  
June 10—Start 8 a. m. Munich, Kesselberg, Partenkirchen, Oberammergau, Landsberg a. Lech, Königsbrunn, Augsburg; 226.4 km.  
June 11—Start 5 a. m. Augsburg, Donauwörth, Nördlingen, Rothenburg a. Tauber, Würzburg, Aschaffenburg, Hanau, Frankfurt am Main; 325 km.

Forty-six makes of cars are represented in the entry list, as compared with thirty-six last year, divided as follows:

Make	1906	1907
Mercedes	20	17
Benz	17	14
Adler	7	11
Opel	9	10
Horch	3	6
Eisenbach		6
Métallurgique	9	6
Blanchi		6
Germain	3	5
Stoewer	1	4
Soldor	1	4
Hexe	1	4
Diatto	1	4
Schellier		3
Argus	2	3
Nacke		3
Protos	2	3
Hering		3
Beckmann	1	3
Zuest		3
Isotta		3
Neue Automobil Gesellschaft		2
Priamus	2	2
Erdmann		2
Sun		2
Ajax		2
Itala	1	2
De Dietrich	4	2
Mixte		2
Napier		2
Siddeley		2
Bayard	2	2
Berliet		2
Duerkopp		1
Martini	3	1
Renault	1	1
Gobron	1	1
Panhard		1
Brasier		1
Ader		1
Clément		1
Belsize		1
Vinot		1
Fiat	11	1
Minerva		1
Darracq		1

#### FRENCH CLUB'S INCOME

Paris, June 1—From the yearly balance sheet just issued by the Automobile Club of France it appears the funds of the club are to a very large extent, perhaps not quite a half, boosted up by the proceeds



of the gambling tables in the club premises. These receipts amount to \$80,000 and more and are judiciously set down on the club books as income from divers sources. For the following year it is interesting to note the club, wisely or not, decided that it would most likely receive but \$50,000 from this divers source. The club counts 2,300 members, which is not extraordinary in view of the number of makers who presumably desire to see their industry encouraged by the means known to the club and its adjoining Société d'Encouragement. The Royal Automobile Club of Great Britain, for instance, has a membership of 3,000. These 2,300 French members pay in subscriptions, fines, etc., about \$105,000, and in addition leave in the hands of the club's croupier the sum of \$80,000 as losses at the gaming tables in the club's premises. This may be termed a tax on the vice of the members. The club also has another and very limited source of income—\$12,000 during the past year—derived from sales of printed matter, guides and interest on investments. The best interest was obtained from the 1906 show, which left \$10,000 profit in the hands of the committee managing the event. A grand total of \$248,000 is arrived at, which is not bad in view of the limited membership. This includes \$40,000 carried forward from the preceding year. About \$50,000 is carried forward to the present year, and the expenses of the club therefore include the following sums: The various commissions—technical, touring, commercial, competitions and legal—come in for over \$12,000. The grand prix cost the club \$11,000 last year over and above the receipts; another \$12,000 was devoted to the payment of claims resulting from the unfortunate Paris-Madrid race. Some \$65,000 was absorbed by the internal economy of the club, personal, rent, etc. The club has a reserve in hand of \$60,000 at the present time.

#### NEW DEAL WITH GERMANY

Washington, D. C., June 8—Animated by a desire to adjust the commercial relations between the United States and Germany until a comprehensive commercial treaty can be agreed upon, plenipotentiaries representing the two countries have perfected a commercial agreement. It will take effect July 1, 1907, and remain in force until June 30, 1908. Under this agreement the rates of duty on motor cycles and motor cars imported into Germany from the United States are as follows: Motor cycles—Weighing, each, net weight, 50 kilos or less, \$23.80 per 100 kilos; over 50 up to 100 kilos, \$17.85 per 100 kilos; over 100 up to 250 kilos, \$16.66 per 100 kilos. Motor cars and motor cycles—Weighing, each, net weight, over 250 up to 500 kilos, \$9.52 per 100 kilos; over 500 up to 1,000 kilos, \$5.95 per 100 kilos; over 1,000 kilos, \$3.57 per 100 kilos.

## WILL TAG TOUR CARS

### A. A. A. Will Place Name Pennants on All Machines Taking Part in Annual Test

New York, June 11—A change in the plans of the touring board regarding the A. A. A. tour, and contests for the Glidden and Hower trophies, has been announced by Chairman F. B. Hower which will result in an innovation of radical character. The rules this year expressly stipulate, the same as they have in former years, that the entrants will not be permitted to carry any signs on the cars telling the names of the cars, or any advertising signs whatever. This rule remains unchanged, and the manufacturers may not put on any signs, but the cars will carry flags telling the make of them and these will be furnished by the touring board.

The reason for this radical departure is that the touring board has been in receipt of many letters from points along the route and from persons not in the trade, who complain that they are not able to tell the names of the cars. It has been represented that almost everyone interested in the tour is interested in some particular make of car and wants to know it when it passes. Recognizing the force of this the touring board decided to have each car carry two small pennants in front, one on each side, bearing the name of the car. This decision has, of course, the hearty approval of the manufacturers and so everyone will be happy. The touring board, by taking charge of this matter, will insure neatness and uniformity and prevent the display of garish banners. The flags carried will be triangular pennants about 3 feet in length, of white body probably, with the lettering in black or red.

This week's bulletin issued by Chairman Hower names four candidates for the Hower trophy, the first to be declared. C. A. Coey, of the Chicago Automobile Club, has changed his nomination and will try for the Hower instead of the Glidden, driving a Thomas Flyer. His number is 101. A. E. Hughes, of Philadelphia, has 100, being in with a 40-45-horsepower Pierce roadster. H. E. Coffin, 102, is in with a Thomas Forty from the Automobile Club of Detroit, while H. O. Smith, 103, enters from Indianapolis with a Premier roadster.

There are twenty-two declarations for the Glidden. A. R. Welch, of the Automobile Club of Detroit, takes Coey's old number, 7, for his 50-horsepower Welch; No. 17 is F. S. Dey, of the Automobile Club of Buffalo, with Old Scout, the Pierce six-cylinder; No. 21, Thomas P. Jones, of the Pittsburgh Automobile Club, names a Pierce Great Arrow; G. A. Weidely, of Indianapolis, No. 19, a 24-horsepower Premier, and A. B. Tucker, New York Motor Club, is booked to drive a Dragon—No. 25.

Entries so far have been rather slow in coming in but Chairman Hower believes that from now on the nominations will be rushed along. He has been told of enough prospectives to make him feel confident that his prediction of more than 100 cars in line will not be far off. The Hower cup contest is going to bring together a fine field of roadsters and should vie with the Glidden in popularity. One western nomination came in today too late to get on the list—C. P. Shoemaker, of Freeport, Ill., who names a four-cylinder Shoemaker for the Glidden under the colors of the Chicago Motor Club. New England is expected to come in strong on the chorus. Columbia nominations are not in but several have been assured. The west is surpassing itself, Hower says.

### GIVE MAYORS A RIDE


Detroit, Mich., June 10—The occasion of the meeting in Detroit of the League of Michigan Municipalities in its annual convention furnished a motor demonstration which far outshone anything in the history of the sport locally. As an outing for the mayors and other city officials the retiring president, David E. Heineman, a Detroit alderman, asked the local owners to give him enough cars to take the entire delegation, numbering nearly 1,000 people, on a ride through Detroit. Factories retailers and private owners answered the call in surprising numbers. They gathered Friday afternoon in front of the Detroit art museum, 150 strong. Flags were installed on each car and the delegates piled in. There was room to spare. Rival manufacturers vied with each other to make the most favorable showing. The parade included practically nothing but new cars and the display as the procession wound round the boulevards and parkways was astonishing. At Belle Isle a scorch was started which gave the delegates a touch of high life not on the program. Of course the delegates were tickled. They showed it by thanking the motorists and electing Alderman Heineman president for another year. Then several of the visiting mayors bought the cars in which they had ridden, which made the motor folk happy, too. A feature of the gathering was the fact that the entire Lansing delegation, numbering over twenty, made the trip both ways by motor cars. The distance is something over 70 miles, but was made handily over rather muddy roads in 4 hours.

### FROM PEKIN TO PARIS

New York, June 10—Associated Press dispatches from Pekin, China, state that three French, one Dutch and one Italian motor cars started this morning in the Pekin-to-Paris race. They were given an enthusiastic send-off by the foreign residents, including the American, Austrian and French ministers. A French band played selections. The Chinese were much astonished, as this was the first time motor cars had been seen in Pekin.



**NH. Van Sicklen, Manager**  
Subscription Two Dollars a Year  
Foreign and Canada Four Dollars



**MOTOR AGE**  
1200 Michigan Avenue, Chicago  
Published Every Thursday by the Trade Press Company  
Entered at the Chicago Postoffice as Second-Class Matter

**Charles P. Root, Editor**  
New York Office  
29 West Forty-Second Street



The Western News Company of Chicago and Its Branches Supply Newsdealers

### MAKING GOOD TIMES



THREE years hence the federal government will undertake the stupendous task of compiling a census and in this will be given the figures which will denote how extensive is the motor car industry and how it has grown in a decade. Unless something unforeseen happens there is every reason to believe that the figures which the government will present to the public will be such as to astound the commercial world and at the same time make it appear that the industry has been too lightly considered in the past. Even those most closely identified with the trade in all its branches are hardly capable of realizing its magnitude, and were it possible to set down in cold figures just what it represents in dollars and cents, the figures would be so great as to be almost beyond ordinary comprehension. The motor car industry has already proved a blessing to the industrial world and to the working-man and more so than is ordinarily comprehended. No better illustration of this could be given than to quote from the observations of the business agent of the International Association of Machinists, who says that "no industry, except it be the railroads—which, of course, are old and firmly established—has made such a marked impression upon the entire industrial world as the manufacture of motor cars. And the end is not yet; it is almost impossible even for the gatherers of industrial statistics accustomed to big tools to attempt to grasp the full import of the meaning of the automobile industry. The machinists feel that the automobile industry is much of a blessing to them—much more so than was the bicycle industry, which assumed stupendous proportions a decade or so ago—for the demands of motor car building afford specific classifications of workmen made almost futile, from the labor union point of view, in the bicycle business on account of the large proportion of unskilled male workers and women. We should say that the machinist's trade is vitally affected by this unprecedented development of the motor car industry, and that a reign of prosperity not likely to be interrupted is the corollary. But the machinists represent only about one-tenth of the interests so greatly benefited by the growth of a business that annually takes so much money from the moderately well-to-do as well as the rich, and puts it into general circulation. The upholsterer, woodworker, steelworker, painter, farmer, waiter in country inns—in fact, the workers in countless lines of

human endeavor—are so greatly benefited that it provides the economist and publicist with unlimited material for scientific discourse." It has even been predicted that the growth of the motor car industry has been the direct means of staving off hard times by putting hundreds of millions of dollars directly into the hands of the country's workers which otherwise might have been hoarded. It is undoubtedly true that there are many people owning motor cars who have not been warranted in possessing such luxuries—luxuries to them—but on the other hand it is not impossible that whatever money has been spent for motor cars would have been spent in some other and possibly more disastrous direction for the individuals who are credited with living beyond their incomes. There is just about so much money to spend and circulate and so long as there is something to induce the people to circulate it there will be little fear of a panic. There is no certainty that the present demand for motor cars will exist for all times, but, on the contrary, there is no visible indication that the demand has been half satisfied, so that the era of prosperity now being enjoyed should be maintained for a number of years to come if the demand for motor cars is to be the prime factor in arranging for so satisfactory a state of affairs.

### CONSISTENT COMBINATIONS



HOULD Percy Pierce be fortunate enough to win the Glidden trophy this year he could be placed in the same class with Ladenburg, the winner of the Herkomer tour, with the credit of having a little better score. Ladenburg won the 1905 Herkomer, was eighth in the 1906 and won the 1907; Pierce won the 1905 Glidden, and was tied with others in 1906. Nothing could better illustrate the existence of combinations of consistent driving and reliable cars, although this statement should be taken to mean that there are not other consistent drivers and other good cars, but when car and man score so heavily in such contests as the Herkomer and Glidden the ordinary observer naturally believes there is something exceptionally good in the units making up the combination. Ladenburg's victory was all the greater because of a greater number of contestants with which he had to contend this year.



### CAUSES AND REMEDIES



MOTING organizations would be wonderfully different from other bodies and even from human beings if they were not lacking in some directions and some particulars; but most motoring organizations are lacking in too many directions to prove as successful as they might in the work they undertake to do. The fact that motoring is comparatively young and that there is a superabundance of work to be accomplished may be responsible for the apparent abridgement of the resources or powers or inclinations of the bodies that assume to represent the fraternity at large—that dissemination rather than concentration prevails. There is a sufficient number of motoring organizations in this and other countries to accomplish much that has not been but should be accomplished, but the lack of concentrated effort in a few directions prevents this much-desired end. It is usually a case of the eyes being larger than the stomach, with the result of gormandizing and foundering. Such an organization as the American Automobile Association, as a sample, is blessed with committees galore, but it usually happens that when such an affair as the annual tour or an international road race is scheduled the committees with work quite foreign to conducting such events become lost in the maze of interest that naturally centers about such contests, with the result that little is accomplished. There are too many committees and there is too much work laid out to be accomplished by men who have other and more selfish deeds to perform. On the other hand, the national trade organizations—and those more directly connected with motoring rather than with the trade—have unquestionably prepared more elaborate programmes than their most ardent supporters and well wishers could hope to see them carry to anywhere near successful accomplishment. Nor does this apply alone to the trade bodies with their big shows or the national bodies with their great tours and road races, but to the clubs, great and small, rich and poor. There is in all these organizations too little concentration and too great a desire to accomplish much, with the natural result of little real effective work. All this chaos could be eliminated if at some particular time the year's work were to be laid out with care and a due regard for what might and what might not be accomplished in the dozen months to come from the beginning of the work.





**C**HICAGO is to have a reliability test—more strenuous than was the one held last year, not only in the matter of penalizations but in the extent of the course, which will approximate 175 miles. This will not only be a sealed bonnet affair, but the coilboxes will be sealed also, and an operator will find it costly in saving penalizations to do any amount of tinkering with any part of his car, even to the tires. It will be up to the entrant to see that all conditions are as nearly perfect as can be in order that a car may go through without costing it points, and this will show what can be done even if it does not show what is done every day.

**W**HAT otherwise proved a splendid test was marred by a fatal accident in the reliability run of the New York Motor Club; but while the weather conditions were such as to make the run difficult in all ways it was such as to be the indirect means of causing a bad mix and a number of protests. There were, however, perfect scores, proving that rain, mud and bad conditions generally do not stop the successful operation of the modern motor car on the highways, bad as they are in most parts of this country.

**E**XCEPTING the tourist trophy event on the Isle of Man the first really big contest of speed in the northern part of Europe for the season is the emperor's cup race, which will be held over the Taunus circuit on Friday of this week, the

eliminating heats to take place on the day before in order to reduce the number of starters to a safe limit. There are close to a hundred entries and the emperor, after a trip over the course, gave the command to reduce the number of starters to a point of safety. There will be two eliminating heats and the best twenty in each heat will be the starters in the final. The Taunus is a difficult but not new circuit, having been used for the Bennett cup race and the Herkomer tour. It is agreed not only that the kaiser was justified in demanding that the number of starters be reduced, but that it was an exhibition of wisdom on his part to take a hand in the proceedings. This may be the means of preventing several bad accidents, although with the reduced number of starters there is no surety that the event will be free from trouble of some sort.

**M**OTORISTS of Illinois appear to be somewhat at sea regarding the provisions contained in the state motor vehicle law recently passed by the legislature, which goes into effect July 1. The salient points have been spread before the public by the press, but there is so much to the bill that a clear understanding has been lacking on the part of those interested and because of this lack of understanding Motor Age publishes in this issue a digest of the bill, with the hope that all its provisions will be made clear, not only to motorists but to the general public, which has an interest to some extent.

**C**LEVELAND is having a hard time to pull off a hill-climb, for its annual event has been postponed twice and there is no telling what obstacle it will meet later. The promoters were put to the expense of fixing the roadway only to have the residents protest to the authorities against the contest and have it suppressed. Clevelanders ought now to cast about for another hill, make one or change the nature of their contest so the public can have no objections that will hold water. Evidence is accumulating to show that the west needs a motor parkway.

**U**NIVERSITIES and other educational institutions have not been slow to realize the importance of the motor car; they apparently believe there is a field for educational work in connection therewith. Washington university of St. Louis has added a course in motoring and most of the Young Men's Christian Association branches have had such courses for the

past couple of years. There is already a field for good men in connection with the development of the motor and the motor car, from the driver to the high-class designer and mechanic in both the pleasure and commercial branches of the industry. It has been said there is a shortage of good men in the industry, and it is probably because of this statement that the educational institutions have opened new departments in connection therewith.

**T**WO WEEKS hence the details of the great Herkomer tour will be presented to the public and there will be a chance to judge between this big German affair and our own Glidden tour. The German tour was finished Tuesday; it was a huge thing, particularly in the matter of the number of entries, which was 162, and must have taxed the capacities of those responsible for the management if this year's event was as successfully conducted as was that of a year ago.

**A**LREADY the grand prix has been responsible for the death of two prominent drivers who were to have been contestants in the big event—Clement and Pin. Both deaths appear to have been the result of fast driving when the course was not in a condition for such work or was not properly guarded, and need not necessarily have any bearing on the race itself, which will be surrounded with all the safeguards that can be devised by the promoters and the government.

## THE WEEK IN BRIEF

Two-hundred mile endurance run of New York Motor Club resolves itself into mud-plug; 40-horsepower Lozier is declared winner of first prize in touring car class and 30-horsepower Haynes in roadster division.

A. A. A. decides to put pennants telling make of car on contesting machines in annual tour; four roadsters already entered for Hower trophy.

Edgar Ladenburg, of Munich, driving a Mercedes, wins the third annual Herkomer tour; was winner of same event in 1905.

Ten cars tied with perfect score in Long Island test run over, but eight come through without point against them.

Chicago Motor Club announces rules for its reliability run June 28; four classes arranged for.

Complete details of running of tourist trophy races on the Isle of Man are received.

First contest for emperor's cup to be run this week over Taunus course in Germany.

National orphans' day celebrated in all the leading cities of the country.

Walter Christle sails for France with his grand prix racer.

Thomas cars gather in more records at track meet in Denver.

## COMING MOTOR EVENTS

**Emperor's Cup Race**—Road race for emperor's cup under auspices of Imperial Automobile Club of Germany, June 14.

**Sealed Bonnet Test**—Automobile Club of America's sealed bonnet contest, starting and finishing in New York, June 19-22.

**Scottish Trials**—Reliability trial under auspices of Scottish Automobile Club, June 25-29.

**Chicago's Reliability Run**—Chicago Motor Club's reliability run to Waukegan, McHenry, Elgin and Chicago, June 28.

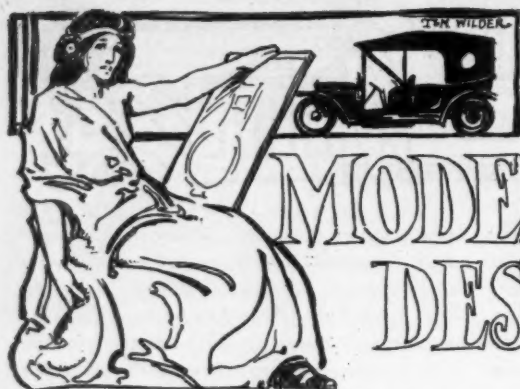
**Grand Prix**—Second running of French grand prix, July 2; also sportive commission cup over same course.

**Glidden Tour**—Start of Glidden tour from Cleveland, O., July 10; route through Toledo, thence to Chicago.

**Criterium**—Automobile Club of Belgium's Criterium, July 12-20.

**Ardennes Cup**—Automobile Club of Belgium's Ardennes circuit race, July 22.

**Liedekerke Cup**—Automobile Club of Belgium's race for Liedekerke cup, July 23.



# SOME TRENDS OF MODERN AUTOMOBILE DESIGN\* By Victor Loughheed PART I



EVERYONE interested in and familiar with the development of the motor car must recognize that future progress toward the ideal car can proceed only in one of two definite directions. Cars either must remain substantially as they are, receiving refinement solely in minor details, or they must undergo comparatively radical improvement, resulting in the ultimate disuse of constructions now regarded as standard. It is the history of all mechanical progress that the achieved result of one period invariably discloses anticipations of it in some period immediately preceding. To consider, for instance, the current status of any branch of engineering while referring back from it for 10 years is to learn that there is little in present-day novelties not more or less definitely anticipated in some fairly familiar development of years ago had the experts of that time but perceived it. And, to continue this reasoning, while assuming that the motor car must make progress in the future as it has in the past, does it not follow, then, that the germs of much of the progress to come must exist somewhere in some form today?

Casually regarded the mechanism of the new conveyance might seem to controvert this theory, especially were it rashly concluded that the forms now widely established as the best motor car engineering say the last word that is said on the subject of internal-combustion engines. Such a view, however, can be founded only on utter disregard of a most absolute fact, which is that the motor is only one form of a general type which in many essential respects has attained its highest technical development in marine and stationary applications. Few engineers who know their subject will dispute the basis of this statement, untenable though it may seem at the outset. It is not to be denied that the always difficult problems of mechanical compromise and expediency, with the end of

EDITOR'S NOTE—This is the first of a series of five articles by Victor Loughheed; part second, The Carburetor and Its Future, will appear next.

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securing extraordinarily practical and special results, have been solved in the motor car engine with a degree of success perhaps unparalleled in engineering history. But it is equally true that the soundest engineering, as expressed in the production of exceptionally reliable and efficient internal-combustion engines, is today to be found not in the motor car but in the best marine and stationary practice. In the work, then, of marine and stationary engine builders may there not be at least dimly presaged certain of the elements of the motor vehicle of the future?

Certainly it will be conceded that no motor car engine is as efficient as the Diesel, with an indicator card efficiency of 42 per cent; certainly none is more reliable than the Mietz & Weiss, which will run for a month on kerosene without stopping or attention; and certainly none is so light to the horsepower as are the carburetorless Antoinette marine and aeronautic motors, made by Levavasseur of Paris and Puteaux, France.

It is the purpose of this series of articles to point out some of the features of general gas engineering that seem most likely to come into use for motor car service; and incidentally some space is given to the rather obvious deductions and suggestions of one sort and another which logically enough obtrude themselves when current gas engineering is canvassed for features of possible application to the motor car. Every effort has been made to maintain a strict impartiality, with a view to presenting these new ideas in concrete and interesting form, for only thus may their lessons, if lessons they carry, be fully

appreciated by those upon whose work the advancement of the industry depends. To the same end letters from people who either dissent from or approve the various stands taken by the writer will be welcomed and will be printed in Motor Age after each installment of the series. And if in the fullness of time it develops that a pump is better than a carburetor, or that a hot wire may be superior to any present ignition system, surely the same genius for invention that has done such wonders despite the admitted shortcomings of the carburetor principle, or that has succeeded in refining make-and-break and jump-spark ignition to a high degree of reliability, can be counted upon to secure a maximum utility from anything that is to supplant these. Also, if it really proves true that the muffler and the cooling system are in the last analysis to disappear, who will be more pleased over it than those who have struggled hardest to improve these altogether extraneous necessities of present practice? While, finally, is there a motor car manufacturer in the world who particularly prides himself in the presence of the starting crank on his car?

The titles of the five articles of this series, in the order in which they will be published, are: Part 1, "Some Faults and Fallacies of Current Practice;" part 2, "Carburetor and its Future;" part 3, "Cooling System, Present and Prospective;" part 4, "Improving the Cycles of Engine Operation;" part 5, "Car of the Future—Gearless and Clutchless?"

## PART 1—FAULTS AND FALLACIES

It is a fact more or less surprising—according to one's familiarity or unfamiliarity with the conditions that have environed the birth and growth of the motor car industry—that in no other department of applied physics or mechanical engineering do more misconceptions find sponsors

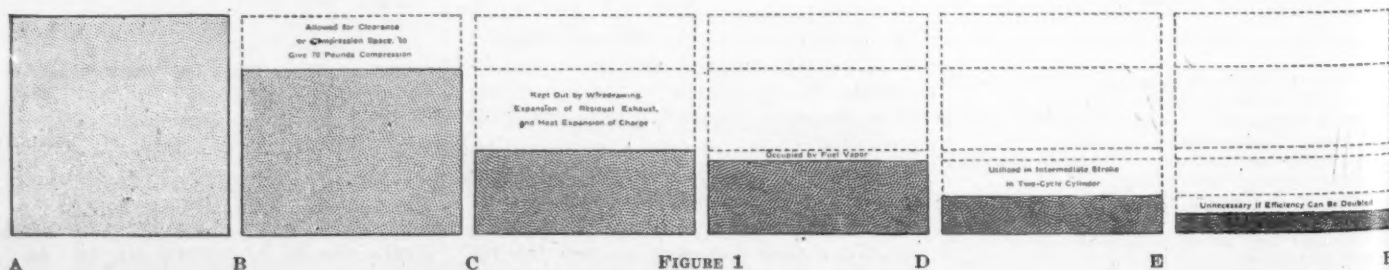


FIGURE 1



or fallacies find adherents. Due, undoubtedly, to the youth of the industry, this condition becomes emphasized almost in exact proportion as it is investigated. The weightiest evidence of it is found in the almost complete lack of general authoritative knowledge on the subject of motor car engineering and in the consequent scarcity of accurately compiled data of real value. Even the literature of the industry is characteristically a case in point—its most commendable examples being books unavoidably inadequate or, worse, altogether out of date; while the quantities of really valuable material scattered throughout the files of the best of the trade periodicals is nowhere concretely available except as individual interest may cope with the truly stupendous task of systematically separating and assimilating the lesser amount of wheat from the reams of chaff.

Recourse to the field of practical work discloses a prospect little more encouraging to the seeker for definite, detailed and exhaustive information. Scientific tests, when made, naturally have been kept secret by the investigators from motives of individual profit; the most satisfactory practical constructions more often than not seem simply to have been chanced upon by the time-tested method of cut-and-try; some of the most successful designers of cars and engines frankly avow ignorance of their competitors' methods and products; and altogether mediocre results are frequently secured at a cost in time and money positively meriting more substantial outcome were motor car engineering the exact science it is destined to become.

In no sense do these conditions constitute a reflection upon the quality of modern cars; instead, they constitute a criticism on the status of the knowledge concerning them. If a car runs, and runs serviceably, it is to be granted that this fact is the important fact—and that the user or the designer himself should not know what really happens in the engine cylinder, for instance, is of an importance altogether subordinate to the fact that whatever does happen produces substantially a desired result, and does so dependably and reliably. None the less it cannot be other than a beneficial iconoclasm to assail mildly a few widely honored fallacies, the continued existence of which in the face of most manifest progress is decidedly more interesting than momentous. Indeed, it has been well said that here is a field for some future Watt of gas engineering. And it is a field vastly greater than that in which the genius of steam dis-

tinguished himself by reducing to a uniform and almost unimprovable practice the diversity of crude contrivances that had spanned the centuries from Hero's turbine to Newcomen's pumping engine. The man who can unify the inconsistencies of modern gas engineering—who can select and combine and perfect and out of his efforts evolve the motor that is to serve the world for a few decades to come—will achieve a result and reap a reward that his contemporaries well may envy him.

#### OBJECTIONS TO PRESENT ENGINE

It is universally admitted that even the best of present engines is beset with a multitude of seemingly inherent defects. And these defects, it will not be denied, constitute today some of the chief ob-

jections with proper quantities of definitely compounded fuel, but which under conditions in the least degree extreme rarely does so. After the carburetor comes the ignition system, which must be counted upon for invariable ignition of the fuel charges, but which, even in its best forms, in the hands of the average user is subject to most exasperating fall-downs, often difficult to locate and not easy to remedy. Subordinate to the foregoing comes a host of more or less erratic minor devices, such as the automatic inlet valve, now less used than formerly, which for its opening depends upon suction and therefore always is somewhat given to the chance of sticking to its seat and causing trouble.

Objectionable complexity of the four-cycle engine is rather reasonably to be urged as one of its shortcomings, as will be made to appear later in this series of articles. There is some reason for supposing that one of the two valves might be eliminated and there is fair prospect of eliminating other complications which are no less apparent.

Objectionable simplicity of the two-cycle engine is too plainly indicated in its most approved forms to be ignored. In a straining for extreme simplicity the common two-port and three-port motors are made so simple as scarcely to function as well as they might. This will be shown conclusively further along in these articles, though certainly it is sufficiently apparent to all who are familiar with stationary types of two-cycle motors. In these the use of valves has proved as beneficial as it has become common. Also some of the best two-cycle marine motors have at least a valve in the piston head, communicating with the crankchamber by way of the bypass, thus doing away with the bypass port. There is a great deal of evidence, for those who

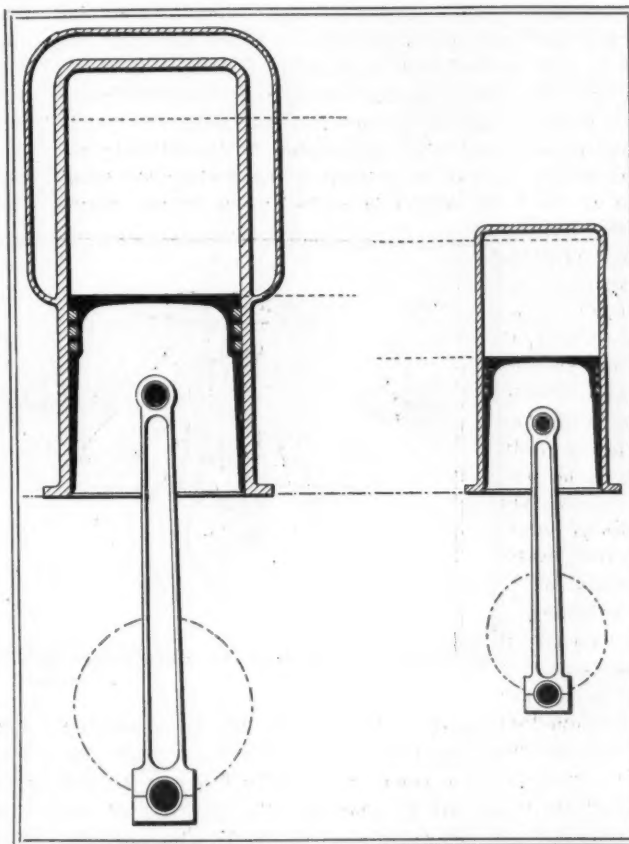


FIGURE 2

FIGURE 3

trouble to seek it, to the effect that the two-cycle principle is capable of giving results vastly superior to any present type of engine, if some complication be introduced in its design.

Muffling the exhaust is another of the anomalous complications commonly regarded as unavoidable with two-cycle and four-cycle engines of the present time. If ever there was a case of two wrongs used to make a right, surely this is one. First the charge is exhausted at a pressure of from 35 to 70 pounds to the square inch and a temperature ranging up to 1,400 degrees Fahrenheit, thus flatly failing to utilize much of the power developed by the combustion of the fuel; then a muffler—additional complication—is tacked on to facilitate this waste of energy by smothering

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the protest of the issuing gases. And only by such extreme means is it today deemed possible to produce a comparatively silent-running motor, despite the serious costs of added complication and reduced efficiency.

Problems of the fuel and of the mixture deserve high rank in any enumeration of the objections to present engines. With most motor car engines today gasoline is the universal fuel. Kerosene has been used to some extent, but only at the expense of several very unsatisfactory features, while alcohol is very far from being as yet the unqualified success its advocates would have believed. Even with gasoline there are more problems evaded than solved. One of the most pressing problems of the time is that of utilizing all available fuels satisfactorily. Gasoline, of low grade as well as high, should be consumed more satisfactorily than it is; the low cost and abundance of kerosene, taken in connection with its ease of ignition and its high calorific value, merit for it an attention it never has received; and the prospective production of unlimited quantities of cheap alcohol in every section of the country from waste agricultural products, together with its peculiar freedom from fire hazard, demand that a way be found to use it reliably and satisfactorily. It is, of course, the means of carburation that are chiefly at fault in preventing recourse to the greater variety of fuels and in minimizing the results secured with those that are used. So in this connection it surely is interesting to learn from marine and stationary practice that there are certain obvious lines of development likely to receive much attention in the near future, with the undoubted outcome of results superior to what are today believed possible.

Low efficiency is a marked fault of all present motor vehicle engines, which in this respect are acknowledged to compare badly with stationary gas and liquid fuel engines. There is little reason why efficiencies much higher than the best now gained should not be secured without any counterbalancing disadvantage. It is all very true that lack of efficiency is just now the least of the builders' or users' troubles, but if it can be shown that high efficiency may actually bring in its train other important improvements, instead of coming to the detriment of more vital features, all arguments against it fail.

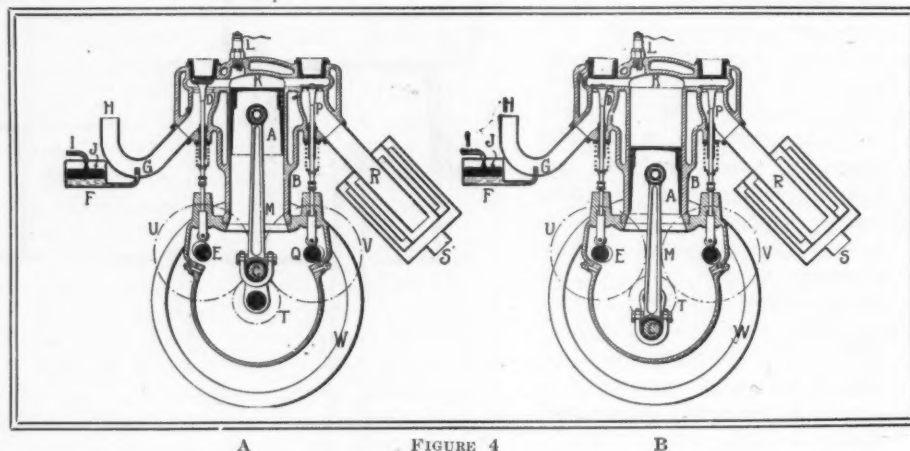
Lack of torque range or flexibility in the ordinary engine is the chief occasion for the objectionable complication of the change speed gear. An engine that can be varied in mere speed from 100 to 2,000 revolutions a minute—a range of which a manufacturer will boast—is not necessarily a flexible engine. True flexibility implies more than this, for it is only the engine that will pull through a wide range of speed, like a steam engine, that can do the work as it should be done and possibly permit elimination of change speed gears.

Intermittence of torque or impulse fre-

quency, next to the lack of torque range, is a serious factor in the imperfect performance of present engines. Instead of a sustained rotating pressure there is a series of more or less widely separated impulses, only merged together by the crude expedients of heavy flywheels and extreme cylinder multiplication or both. A better solution might appear to lie in the direction of more impulses to a given number of strokes through using single or even double-acting two-cycle engines. Certainly this might seem better than addition to the cylinders of the four-cycle engine, as expressed in the present trend towards six and eight-cylinder constructions.

Imperfect regulation is a difficulty more suffered from than appreciated. With the usual systems of throttle control over the power output the phenomena that are involved frequently constitute anything but consistent engineering. With the four-cycle engine throttling reduces the quantity of charge inspired, with the result that the compression is immediately reduced in proportion. And since the usual car engine is worked up to its full power

application are a twinship of evils more deserving of toleration than of approval. Especially misunderstood is the timing—apparently necessary to neutralize a defect in the ignition apparatus itself rather than to produce the actual spark early or late in the cycle. In this theory the writer is upheld by the practice of the Brasier people, who, with a very rapid make-and-break device, and of the Renault people with high-tension ignition and no vibrator or coil, succeed in doing away with ignition timing. Other prominent manufacturers are adopting similar constructions. Further evidence along the same line is found in the now obsolete but in many ways excellent hot-tube ignition systems. Experiments made years ago with these proved conclusively that a motor vehicle engine could be made to work at its highest efficiency at all speeds up to 1,000 revolutions a minute with no ignition lead whatever—a very hot tube, with the heating flame playing upon it at a distance of  $\frac{1}{2}$  inch from the combustion chamber, being used. The complication of the ignition system is due chiefly to the necessity



only exceptionally this can mean nothing less than that the much-valued advantages of compression normally are cast to the winds. Besides this the quantity of exhaust gases retained in the clearance remains constant, while the charge volume is reduced by throttling, so the exhaust gases retained in the cylinder become an increasing proportion of the cylinder contents, to the destruction of any really smooth cutting down of the power, not to speak of their other bad effects. With a two-cycle engine the compression remains constant at all throttle openings because no more exhaust can go out than charge comes in, it being the incoming charge alone that displaces the outgoing one. Consequently throttling cannot change the total quantity of gases in the cylinder, but can only vary the proportion of fresh charge to exhaust gases. Under very light loads, therefore, a two-cycle engine works with mixtures exceedingly impoverished through dilution by the retained exhaust gases.

Ignition timing and ignition system com-

for timing and to the necessity for avoiding ignition during the suction stroke. The writer will undertake to show that if these difficulties can be done away with, with them can go commutator, coils, vibrators, distributors, high-tension insulation, spark gaps and all else in the way of complication, leaving only the ignition plugs and the source of current.

Retention of exhaust gases in the clearance is much more objectionable than is commonly assumed, and it is very certain that absolute reliability cannot be obtained without elimination of this defect. In the first place, the volume of the gases so retained, with average compression space and full load, is equal to fully one-third of the charge—or to more, when it is considered that the exhaust gases are retained under slight pressure because of muffler back pressure, while the charge is more or less attenuated from wiredrawing. Under throttled conditions, as has been pointed out, the percentage is still worse. Besides their bad effect as a diluent of the fresh charges these hot gases may to



some extent collect around the ignition mechanism and by their incombustibility cause mysterious failures of ignition. In other cases they will produce an exactly contrary effect, causing pre-ignition as a result of the heat they impart to the incoming charges. The high efficiency and reliability of the Atkinson and other scavenging engines is proof enough of the desirability of removing every vestige of residual exhaust after each explosion. And if more proof is wanted consider the addition to the work area of an engine diagram immediately after an explosion has been missed—a phenomenon often observed in manometer tests of internal combustion engines.

Size and weight are not generally considered respects in which the motor car engine is found wanting. Nevertheless it can be easily shown that the size of charge required to give a certain result when most effectively handled is ridiculously small as compared with the size of cylinder now required to handle it. For instance, to explain by assuming a hypothetical case, if full charges of fuel could be got into a

the exhaust valve closes, and heating of the charge before the inlet valve closes. At high speeds the wiredrawing probably is most marked, with retained exhaust a close second. At low speeds anything gained by reduction in wiredrawing is likely to be lost by increased heating of the charge and complete expansion of the retained exhaust during the greater time that elapses before the inlet valve closes. Also the use of compensating carbureters with auxiliary air openings that close at low speeds may prevent as much reduction in wiredrawing as might be expected otherwise. At D there is subtracted the space occupied by fuel vapor, on the theory that inspiration of the fuel as a gas with the air is in several respects objectionable. This brings the actual air in the charge down to 108 cubic inches. By now assuming two-cycle instead of four-cycle operation the 54 cubic inches at E is reached as the amount necessary to maintain the original power output. And if an efficiency even approximating that of the Diesel engine—which is more than twice as efficient as any present motor car engine—can be

obtained effectively in a cylinder of only three times this volume—81 cubic inches. This would mean a reduction from present four-cycle engine cylinders to a volume only one-fourth as great for a given power—a startling difference, as is shown diagrammatically by figures 2 and 3. It will be noted that the cylinder shown in figure 3 is pictured without waterjacket or other cooling means—a detail that the reader may regard as necessary, but which the writer will endeavor to prove is not.

Another line of reasoning, confirmatory of the one just outlined, can be developed by figuring back from the fuel consumption of any modern motor car. Take, for example, the case of a car that runs 15 miles to the gallon on the high gear—a not uncommon figure. Assuming 34-inch driving wheels, they will make 8,598 revolutions in going the 15 miles. With a bevel gear ratio of  $3\frac{1}{2}$  to 1 this means 30,093 engine revolutions, which with a four-cylinder four-cycle engine requires 60,186 explosion strokes. This figures  $1/260$  of a cubic inch of liquid fuel to the stroke—a gallon being 231 cubic inches. The best authorities agree that a given volume of liquid gasoline requires from 8,000 to 10,000 volumes of air to effect its complete combustion. Taking it at 9,000, this calls for 34 cubic inches of air, or the approximate contents of cylinders  $3\frac{1}{2}$  by  $3\frac{1}{2}$  inches, though actually cylinders of two or three times this capacity will be used, proving conclusively that present cylinders actually function with charges nowhere equal to their measured capacities.

Cooling systems, in fact, by their variety alone if in no other way, stamp themselves as details still scheduled for considerable evolution. In steam engineering every effort is made to swaddle effectively the cylinders in asbestos, wooden and other heat-retaining jackets. In gas engineering the other extreme appears and the closer and more efficient the refrigerating plant that is packed around the cylinder the higher it is regarded. Is it not just possible that in years to come there may be struck a rational mean between these extremes in the use of cylinders that require no external means to keep them either hot or cold and thus avoid the expensive plumbing and the fan and blower systems now required?

Necessity for cranking is a mechanical abomination. The most that any one has the hardihood to argue for it is that it is a necessary abomination. In the writer's opinion this still remains to be seen and it is consoling to know that there are at least a few who, however misguided, have hopes that the starting crank ultimately may be left off without its absence entailing the presence of something still more objectionable.

Single direction of rotation is a settled principle of motor car engine operation today, even with the few cars that are propelled by the current type of two-

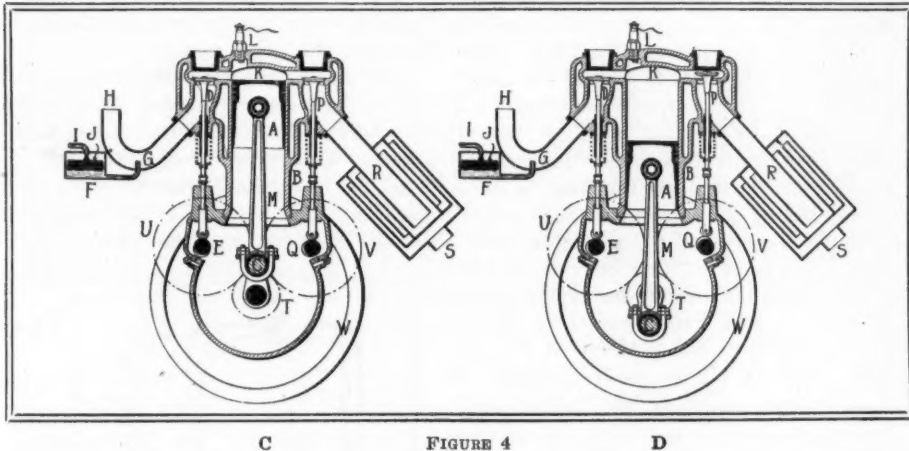


FIGURE 4

cylinder and burned during every down stroke—two-cycle—as efficiently as the Diesel engine consumes its charge, the reduction in charge required would be about as is shown in figure 1. The captions to this illustration are largely self-explanatory, but it is well to emphasize that the condition assumed is less far-fetched than might be imagined. The total cylinder capacity—320 cubic inches—shown by the area at A is about that of the average 35-horsepower four-cylinder engine. The 240 cubic inches shown at B, then, certainly is all the fuel the cylinders can inspire when it is considered that the volume swept by the piston, plus compression space, equals total capacity. The next assumption—that the charge is attenuated one-half, to 120 cubic inches, as at C—may be disputed in degree but not in substance, for it is a fair deduction from the few tests that have been made. To produce such attenuation there is wiredrawing through the intake passages and the carbureter, expansion of the gases retained in the clearance and not reduced to atmospheric pressure before

had, the 27 cubic inches shown at F are enough to produce in an ideal two-cycle engine the power now secured from a four-cycle engine of the comparative cylinder volume shown at A. Such efficiency may seem at first very remote, but ceases to appear so when the means at hand for gaining it are considered.

Among these are the reduction of heat losses to the cylinder walls by keeping the walls hotter and expanding the charge faster, the use of higher compression, the maintenance of compression despite throttling, scavenging out every vestige of residual exhaust and lowering the terminal pressure by greater expansion. Of course it is not suggested that it ever is going to be possible to handle a charge of a given volume in a cylinder of no more corresponding capacity, but the point made is that now a cylinder of 320 cubic inches is required to secure the results that are not too remote to be probable from the use of individual charges of 27 cubic inches—about one-twelfth as much. Suppose it should prove possible to handle the 27 cu-

cycle engines, which in marine service are made to reverse with considerable reliability. With engines made reversible the reversing part of the change-speed gear can be dropped and if development in this direction is not both logical and desirable, will some one please explain why such is not the case?

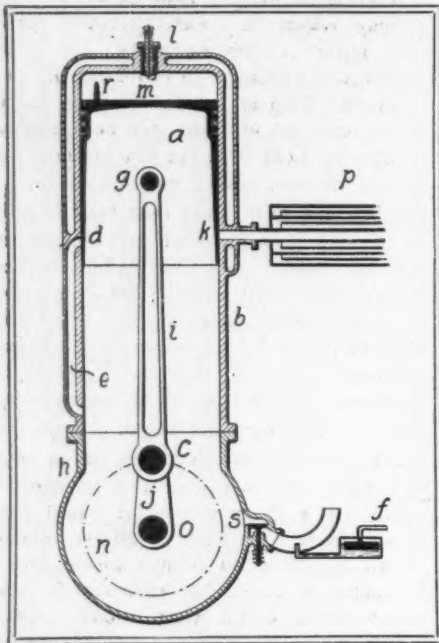


FIGURE 5—A

Complication and cost are natural consequences of the other defects admittedly possessed by present-day engines. If the much-anticipated low-priced motor car of the future is to come it must come by simplified rather than by cheapened construction. The manufacturer today has little recourse in this regard. To approach horse vehicle prices he has no option but to sacrifice quality, which he usually prefers not to do. If he could sufficiently simplify construction he could maintain his profits, reduce prices and turn out high-grade cars fully as serviceable as are those he makes at present.

#### WHAT HAPPENS IN THE CYLINDER

As a rule it is only the layman or the very new engineer who presumes to be dogmatically sure of his knowledge concerning the phenomena involved in the action of an ordinary internal-combustion motor of any of the several approved types. The genuine expert or the successful designer—the serious investigator who has devoted much time to his study of the problems involved in what is in many respects the most mystifying and tricky mechanism man's ingenuity has contrived for his own bewilderment—knows that so far from it being an open book there is no equally practical engineering subject today so hedged about with ignorance and abstrusity, or more in need of full investigation, definition and elucidation, than is the subject of gas engineering.

The action of heat engines, however, despite the complexity of the phenomena

that confuse the finer points of their operation, is subject in a general way to a few important and invariable laws, requiring definition before discussion, so widely are they misunderstood. In no sense may these laws be disregarded by any one making the least pretense of understanding the subject. First it must be understood that the motor car engine, like other internal-combustion motors, is essentially a heat engine, deriving its power solely from the heat units released in the combustion of the fuel and applied to the expansion of a volume of gases. Theoretically the power thus available is determined definitely by the kind and quantity of fuel used, independently of all considerations of mixture proportions, as long as ignition is effected and there is at least enough air present to complete combustion. Practically the power applied to useful work must bear some relation to that theoretically available, and it is this relation that is the measure of engine efficiency. The expansion of the gases in a gas or liquid-fuel engine is subject, of course, to the invariable laws that apply to heated gases of all kinds under all conditions. The efficiency therefore possible to secure becomes purely a matter of utilizing the available heat to expand the gases, and for no other purpose whatever. Or, to state it in another way, no matter what the components or proportions of the mixture used, it is the heat possible to develop by its combustion that constitutes the measure of the available power. And, since some of this heat is certain to be wasted because of the imperfections of even the best mechanism, there can be no such thing as an efficiency of 100 per cent. Instead the practical condition is that, though complete and proper combustion of a given amount of a given fuel will produce a given amount of heat, always equal to some definite power, this power is capable of being manifested in useful form only in a degree proportionate to the efficiency of the motor. Under these conditions any variation in the amount of the combustible element of the charges cannot vary the heat and consequent power otherwise than in direct proportion, all other conditions remaining the same, and thus may be made an excellent means of controlling the power output. In fact, this system of regulation by varying the mixture proportions instead of quantity is used with the greatest success in highly-efficient stationary and marine engines.

This is flatly contrary to a theory entertained by many who, carried away by the fact that there are certain proportions of fuel that at atmospheric pressure consume most efficiently and completely and ignite most readily, rashly conclude that only these selfsame proportions are capable of use with high efficiency under pressure within the engine cylinder.

As a matter of absolute and well-established fact nothing of the sort is the case,

and, though too rich a mixture will fail to deliver up the full heat value of the combustible element simply because of a lack of air with which to burn it, a lean mixture will afford upon ignition a heat value fully commensurate with the quantity of fuel it contains. It is true that under some conditions, particularly with low compressions and exhaust-adulterated charges, there may be difficulty in igniting a lean mixture, but this is a question altogether aside from the one at this moment under discussion and having little bearing upon the power value of a mixture and the efficient practical utilization of its combustible element. It is a peculiarity of gaseous mixtures that their specific heat is very low, making it imperative, once the charge within the cylinder is ignited, that it be lowered in temperature by expansion with the utmost possible rapidity—if the pressure is to be transformed into work instead of uselessly and objectionably lost through transference of the heat units to the cylinder walls. It is because of this peculiarity that attempts to borrow from steam engineering the compound or multi-stage system of gradual expansion have not resulted so successfully as with the older power.

Theory and practice, like science and religion, often are regarded by superficial thinkers as irreconcilably opposed to each other. Such people forget that all good cars are blueprints before they run on the highways and theories in the mind of the designers before they are planned on the

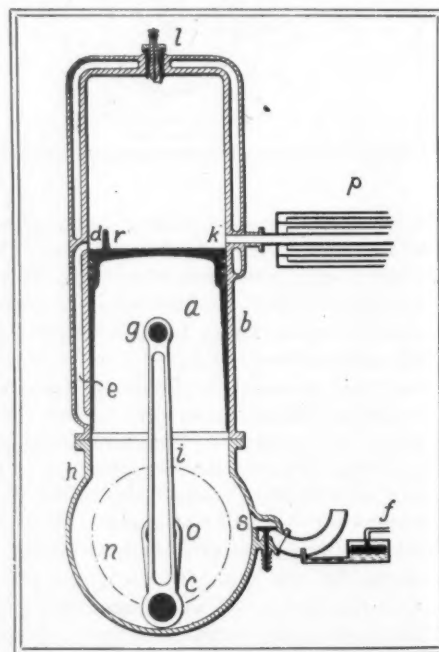


FIGURE 5—B

drawing board. Nevertheless in gas engineering the supposed conflict between theory and practice finds much to emphasize it. Some of the best motor car theory is some of the worst motor car practice, and some of the best motor car practice is some of the worst motor car theory. Of course in these cases there



must be something wrong with either the theory or the practice, but this something more often than not is exceedingly obscure. Take, for example, compression and the explanations of its advantages. Not one authority in a dozen gives even a plausible statement for its desirability. The usual expert is content to know that these advantages exist and to let it rest at that. Only in the most infrequent cases is he familiar even with the stock platitudes on this subject. As a matter of fact it is something of a question with the foremost authorities as to just which of the merits of compression actually are the important ones. Theoretically there is no reason why a given mixture should not be burned as efficiently without compression as with and there are many excellent engines running today in which compression is not employed. Practically, nevertheless, very great advantages accrue from the use of it.

Probably it can be asserted without fear of contradiction that there are six principal points involved in the improvement in practical results that are realized with compression. First of these is the reduction of wall space to which a charge of given weight is exposed, the advantage that arises from this condition being a reduction of the heat losses to the cylinder walls. The second point concerns the heat imparted by compression, which facilitates thorough vaporization of liquid fuels and makes for intimacy of the mixture as well as for ready ignition. A third point—consequent, of course, upon some of the others

une of the exhaust gases that remain in the clearance to heat and foul the incoming charge. Probably the most important of all of the advantages of compression is that it makes combustion both more complete and more rapid, doing this in two ways—by increasing the rapidity of flame propagation and by reducing the distance to which the flame must be propagated. A final advantage is the keeping down of the size and weight of the engine, which would have to be enormously large and heavy to develop a given power with uncompressed charges of gas.

In the matter of the combustion, it is well to note that velocities of flame propagation are enormously greater than the popular idea supposes them to be, basing its opinion upon the action of mixtures burning at atmospheric pressure—the only condition under which extensive published tests have been made. One has only to observe the skyrocketing of the pressure rise in manograph diagrams from gas engines to realize that a rate of flame propagation of 3,500 feet a second is one thing and a maximum piston speed of 500 feet a minute another and that something more reasonable than slow combustion must be found to account for the common necessity for advancing ignition. Another conflict between motor car theory and motor car practice is discovered in the straining by some designers for spheroidal combustion chambers, to secure maximum capacity with minimum wall area, while other designers apparently equally successful in securing practical results disregard this point utterly. On paper it is the best of good theory that a combustion chamber should be as nearly spherical as possible and there is no doubt that the concave piston and the domed cylinder head, with the valves directly in the latter, have some appealing arguments back of them.

Less extreme tendencies in the same direction are disclosed in all efforts to group the exhaust and inlet valves on the same side of an engine, though here the additional claim is often urged that it is poor policy to dispose the hot exhaust valve and the cool inlet valve on opposite sides of a cylinder, thus causing a supposed inequality of expansion and contraction. Also, very possibly, when the valve pairs are kept together the inlet may exercise a not immaterial cooling effect upon the exhaust. All of which sounds plausible and has undoubted foundation in fact. The point seems to be that though these effects exist they often are negligible in magnitude, for some of the best motor vehicle engines made totally disregard the principle of the compact combustion chamber and yet contrive to run about as well as the others. A simple instance that suggests the profound difference between practice and theory is a rarely-mentioned objection to the concave piston head. Used with a horizontal engine this design may prove quite satisfactory, but with

vertical engines the concavity simply fills up with oil, whereupon its assumed advantages cease to exist.

A universal fallacy is that of starting on compression. Ask any car user or the average expert or designer if he knows of an engine that will hold its compression. In ninety-nine cases out of a hun-

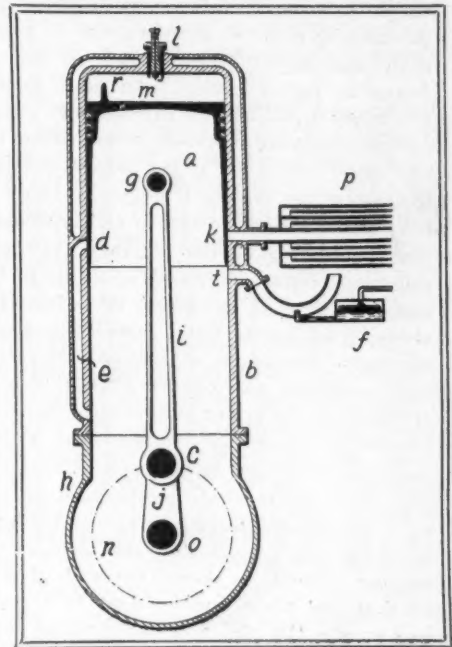


FIGURE 6-B

dred the reply will be in the affirmative. Yet nothing of the sort exists. No engine will hold its compression. What really occurs is that the engine holds mixture, at little if any above atmospheric pressure, and it is a very well-built engine indeed that will do even this for more than a few hours. To test the correctness of this statement run any multi-cylinder engine and stop it by shutting off the ignition. Then immediately open all the relief cocks on top of the cylinders and see how much compression escapes. A slight puff will be the extent of the resultant noise, a matter of ounces rather than of pounds. Thus simply may it be proved that when an engine starts by manipulation of the ignition after having stood for a period it starts by the explosion of practically uncompressed mixture, followed, of course, by the explosion of cylinderfuls of compressed mixture once the motor is under way and the other cylinders take up the cycle. In fact, after thus relieving any slight residual compression it will be found that the average self-starting motor remains fully as self-starting as it was before. Even at low speeds the compression with the average engine is materially less than it amounts to at high speeds, in consequence of the leakage that takes place to at least some extent past the best fitted piston rings. The existence of such leakage is proved conclusively in that the starting crank of almost any engine, with good bearings, can be turned with ease if turned slowly

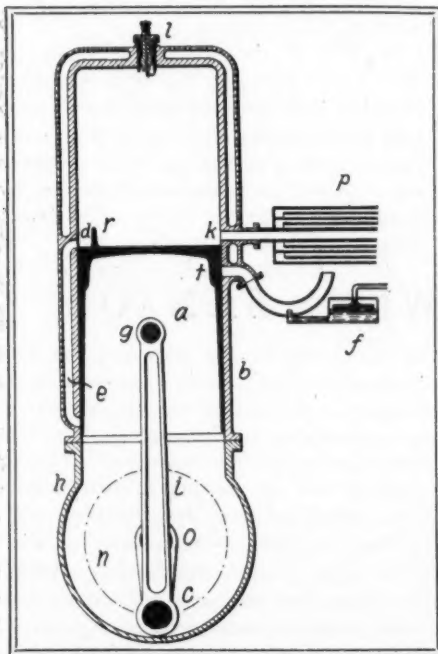


FIGURE 6-A

—is that compression raises the mean-effective pressure, by raising the initial pressure after ignition, to an extent much more than offsetting the negative work of compression. An incidental virtue of compression, as it is applied to established types of engines, is that the higher it is carried the more it reduces the comparative vol-

enough, thus permitting the contents of the cylinders to leak past the pistons and their rings very gradually.

#### THE FOUR-CYCLE ENGINE

The four-cycle engine is at present most in evidence of the two prevailing types of vehicle engines. Nearly all successful cars are propelled by four-cycle engines, which possess a certain positiveness of functioning over the current forms of two-cycle engines, and thus recommend themselves to manufacturers who seek great reliability even at the expense of some complication and reduced torque, balance and power. It is not to the purpose herein to describe the four-cycle engine at length, but for convenient reference and criticism the functioning of the ordinary type of four-cycle motor is illustrated at A, B, C and D, figure 4, in which the different views, from left to right, picture the four successive operations of suction, compression, explosion and exhaust. In a motor of this type the power is developed in only one out of every four strokes—that is, in every other stroke in a single direction. The three intermediate strokes are given up to the several operations of exhausting, inspiring and compressing the successive charges. At A is shown the end of an exhaust and the commencement of a suction stroke, the piston A being at the top of its travel within the cylinder B ready to proceed downwards as the crankshaft T revolves. During this stroke the inlet valve D is held open by the cam E, while the suction of the piston inspires through it a mixture of air and fuel vapor from the carbureter F G H I J. The end of the suction stroke and the beginning of a compression stroke is shown at B, in which the piston is at the lowest point of its travel, ready to rise. Before it is fairly started on the upward movement the inlet valve is closed, so the continued rise of the piston compresses the cylinderful of gases shown at B into the comparatively

small compression space shown at point K.

This condition reached, at C, the compressed charge of fuel is ignited by an electric spark between the terminals of the spark plug L, whereupon it immediately burns with explosive rapidity, becoming exceedingly hot in so doing. This heat produces great pressure by its tendency to expand the gases and the pressure impels the piston down on the working stroke so forcibly that a powerful rotative effort is exerted on the crankshaft during the stroke, this effort being communicated from piston to shaft by means of the connecting rod M and the crank C. At D the end of the power stroke and the commencement of the exhaust stroke is shown, the combustion being completed and the piston ready to rise again. During its rise the exhaust valve P is held open by the cam Q, so that the piston forces out through it the cylinderful of consumed gases, which still are under considerable pressure and therefore are discharged through the muffler R, within which they are expanded gradually and cooled, to make them issue into the outer atmosphere at the vent S without objectionable noise. This brings the series of operations back to the point shown at A, and as the engine continues to run the same cycle of four strokes is repeated again and again.

#### THE TWO-CYCLE ENGINE

Of the two types of internal combustion motor with which practically all of the progress in the motor car field of gas engineering has been made, the engine at present and in the past least prominent is the two-cycle, though this type gives many indications of soon outranking its rival as a result of future developments. A two-cycle engine is one in which every stroke of the piston in one direction is a power stroke, the introduction, compression and exhaust of the charges being effected at the ends of and during the intermediate strokes. A typical two-cycle

motor is the two-port, illustrated in figure 5, in which a is the piston, b the cylinder, o the crankshaft, j the crank, and i the connecting rod. As pictured at A the engine is at the commencement of a power stroke, the compressed charge at m having been ignited by the spark plug l exactly as in the case of the four-cycle engine previously described. As the piston is moved downwards by the force of the explosion, shortly before it reaches the end of the stroke it uncovers the exhaust port k, through which a portion of the spent gases at once escapes to the muffler p. Immediately after k is uncovered the continued downward travel of the piston uncovers the bypass port d, which connects by way of the bypass e with the crank-chamber n. Meantime, the position now being that shown at B, the downward movement of the piston has compressed within n a charge of mixture inspired during the previous upstroke through the inlet valve s from the carbureter f, so this charge now rushes through e and d into the cylinder. The deflector r prevents it from rushing straight across and out at k, instead causing it to flow upwards until the cylinder head deflects it downward. In its flow it scavenges out ahead of it the residue of exhaust gases. On the return stroke, from the position shown at B, the piston covers first d and then k, after which it compresses the trapped charge until it is fired in the usual manner. The three-port two-cycle engine is shown at A and B, figures 6. The chief difference between this and the preceding type consists in the substitution of the inlet port t in place of the inlet valve s, figure 5. This port opens directly from the crank-chamber into the carbureter and is uncovered by the piston near the termination of each upstroke, so that no valves whatever are required, as is the case with the two-part motor, and any form of carbureter may be used therewith.

## HOPE TO REPLACE GASOLINE WITH BENZOL

Paris, June 1—The steadily increasing price of gasoline or motor spirit is prompting more than ever the present strenuous efforts to discover some fuel to advantageously replace it. This is especially the case in Germany. Tests have been made of benzol and it is said results have been obtained which will cause the fuel to have an influence in the near future on the gasoline market. The qualities of benzol have been known for some time, but active research in the matter has been suspended in view of the impossibility to compete with the low price of gasoline in the past. Benzol is by no means an ideal fuel for motors, but its use is now of interest in view of its comparatively low price and the possibility of using it in gasoline motors with very little modification of the mechanism. Benzol is one of the by-products in the manufacture of coal

gas and for some years the only known source was the tar produced in gas works which contains, it is declared, about 1½ per cent of benzol and tolnol mixed.

The ever-increasing needs of the chemical color industry which used considerable quantities of benzol caused the demand to exceed the supply. The establishment of coke distilleries where coke for blast furnaces is produced, supplied the needs of the market in finding a cheaper method of obtaining tar, benzol and ammonia. In 1905 there were in Germany some 19,300 distillation furnaces in operation, of which 9,110 or 47 per cent were equipped for the utilization of residues for the production of tar, benzol and ammonia. The quantity of benzol produced is only 5 per cent of the coal distilled, it is estimated.

In France, where more than 50,000 tons

of motor spirit are consumed annually, they have also become alarmed for the future of the motor car industry if the present rise in the price of spirit is maintained. One or two makers, especially the Gobron and the Brillie, do push and sell cars which can use denatured alcohol as a fuel, and Mr. Gobron, who is also a senator of the French chamber, confidently states that the price of this fuel will see a great decrease in 2 or 3 years. In 1900, when the government took an active interest in the question, the price dropped as low as 7 or 8 cents a quart, but now it is double that price.

The French club, at the instigation of the Marquis de Dion, has decided to institute a permanent competition for the discovery of a carburant to replace the present much used gasoline and valuable prizes will be given therewith.





# THE READERS' CLEARING HOUSE



## DRY AND STORAGE BATTERIES

La Rue, O.—Editor Motor Age—I would like to ask an opinion as to how often I should change batteries in a motor fire engine. We have a fire engine driven by an opposed gasoline motor. The current is furnished by ordinary dry cells and I would like you to advise me about changing batteries in such an important apparatus. I am fire chief and some members of the council think I am using too many batteries. I have had considerable experience with dry cells, but have very little faith in them. If they should play out at a fire it would be a very poor place to change them. I recommend storage batteries but want to hear from you.—Newton H. Davis.

Some day the city council will wake up to the fact that it does not pay to be penny wise and pound foolish. Take no chances on dry cells, which will work as well as anything when new but which are at best unreliable. Go further and have two storage batteries, each of 60 ampere capacity, and alternate their use. Have each recharged once a month, whether used or not. By having one charged on the first and another in the middle of the month both will be kept in good condition and there will always be one ready while the other is being charged. It is impossible to tell how often dry cells should be changed—when they need it, and this can be determined only by testing with an ammeter. When they show below 10 amperes they are not safe to trust.

## CHANGING AN OLDSMOBILE

Marion, S. C.—Editor Motor Age—I read something some time ago about boring out the cylinder head of a 1903 Oldsmobile runabout and putting in larger valves. Will you please let me know how much boring these passages will stand and how much can the valve diameter be increased with safety? I wish to try to dissolve the rust and scale in the water jacket with a 10 per cent solution of sulphuric acid. How long can it be left in the water jacket without doing damage? Of course I will disconnect radiator and pump when I use it.—R. P. Blackwell.

Without knowing the actual dimensions of the valve chamber of the 1903 Oldsmobile runabout, it seems entirely safe to say that the walls are not less than 3-16 inch thick and probably they are 1/4-inch thick. Making a reasonable allowance for errors in setting cores, etc., it should be safe to increase the size of the valve chamber 1-16 inch on each side, or 1/8-inch diameter. The diameter of the valves can be increased the same amount. You will probably find that the valves open too late and close too early for the best results. They should open with the crank about 35 to 40

degrees from the outer dead center and should close with the crank about 10 degrees past the inner dead center. Increasing the valve dwell in this way will make it possible for you to increase the lift slightly also, say 1-16 inch, and the effect of these three changes should be to increase the engine power very considerably. It is impossible to make a definite statement regarding the length of time that sulphuric acid solution can remain in the water jacket. About a 10 per cent solution should be used and after letting it stand for 10 or 15 minutes it should be drawn off and the jacket flushed with clean water. After this inspect the jacket to see how much of the rust and scale has been removed, and if necessary repeat the acid, using a fresh solution if necessary. The acid will attack the rust more quickly than it will the pure iron, but the quantity of acid and the length of time necessary will all depend on how much rust and scale there is to be removed.

## CONNECTIONS LOOSE

Lawrenceburg, Ind.—Editor Motor Age—Will you please give me some information through the Readers' Clearing House on the following: I have a single-cylinder Oldsmobile runabout, the spark for the ignition of which is generated by means of dry cells. Occasionally while running the motor will cease firing entirely, but by moving the switch lever on and off the engine will again fire regularly.—B. D.

It ought to be plain that there is a poor circuit in the primary system, either through the points on the switch being covered with dirt of some sort or else through a wire that has become loosened at its connection at the switch. Clean the points of contact and go over all connections to see that a good circuit is assured.

## ILLINOIS LAW AGAIN

Rossville, Ill.—Editor Motor Age—Will you please tell me if it is necessary to have a state license to drive a car in Illinois, the same as in Indiana, and if so how to secure one?—F. W. Matthiesen.

Alton, Ill.—Editor Motor Age—I noticed in the last issue of Motor Age that the new motor vehicle law has been passed and I also noticed in the Record-Herald that the state does not issue the tag, only a license. Kindly let me know where I can get one. Also, does the bill include the clause compelling a motorist to stop his engine every time a farmer holds up his hand? Does it keep country towns and villages from holding up a motorist for a license to go through the town and can any town in the state pass a speed law? I do not think there is any danger of a motor car going over 15 miles an hour

on our dirt roads. I have convinced many farmers that it does more harm than good to stop a machine when meeting a frightened horse and if the owner of a machine had to stop his engine every time he met a frightened horse it would be a great hardship.—C. D. Flack.

In the current issue of Motor Age, under the heading Legal Lights and Side Lights, appears a digest of the new Illinois law and this answers all the questions that can be suggested. It is all Motor Age knows of the law after going through it with care and with a desire to present it to its readers in a condensed form.

## WHO WANTS A CHAUFFEUR?

Columbus, O.—Editor Motor Age—I am a reader of Motor Age and take the liberty to write you for information. I am an engineering student at the Ohio State University and have had sufficient practical experience to handle motor cars. I also took the Columbus Y. M. C. A. course and think I am capable of caring for a car. Will you inform me where or by what means I can get a position as chauffeur in or around Chicago or in Ohio for the summer or a longer time?—Paul Hawkins.

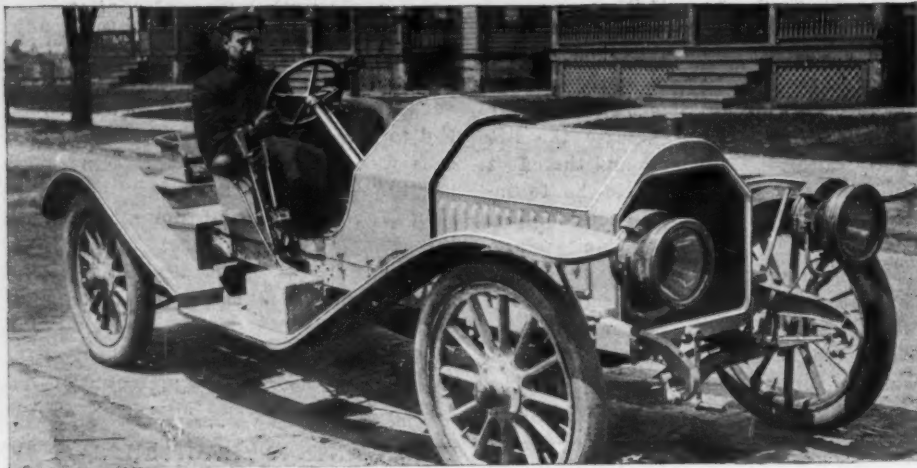
Make application to the prominent dealers, stating experience, age, wages desired and any other information; if a chauffeur is needed you will probably be called upon by correspondence.

## KNOCKING MOTOR

Oxford, Ind.—Editor Motor Age—Will you please inform me what causes a two-cylinder Pope-Hartford engine to knock and heat when the water circulation, the oil feed and the carbureter seem to be all right? On level roads the car will run all right and not knock much, but just as soon as I come to a hill I have to close the throttle or the motor sounds as though it would tear itself to pieces. I thought it might be getting the spark too soon, but it does not kick in starting. It is a new car and has not been run over 300 miles. There are no short circuits.—D. K.

Apparently the spark is advanced too much when the car climbs hills. There is a possibility that there is a lack of lubrication, though this is not the apparent difficulty. Try retarding the spark on ascending a hill and see if this does not locate the trouble. If not, then try excessive lubrication. It will be well to put a little kerosene in each cylinder and permit it to stand over night in order to remove some of the accumulated carbon. If there has been excessive lubrication and a poor mixture, it is more than likely carbon has become deposited on the top of the piston, on the valves and on the cylinder heads and that pre-ignition takes place.

# MOTOR CAR DEVELOPMENT



STEARNS' SIX-CYLINDER 45-HORSEPOWER ROADSTER



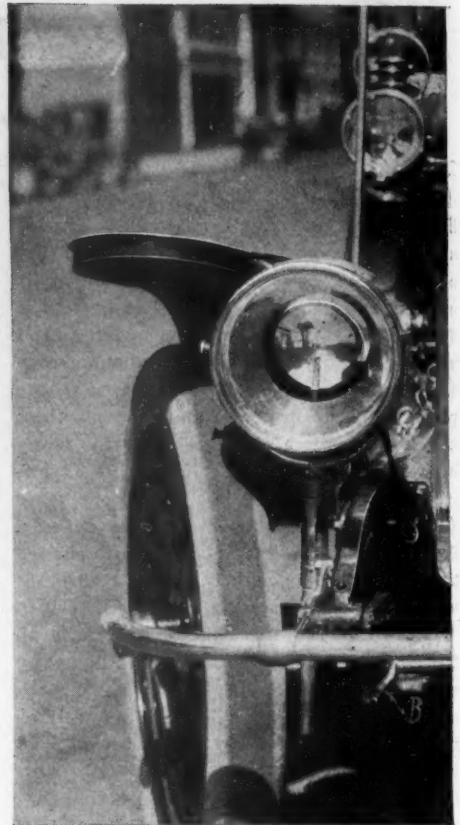
THE F. B. Stearns Co., Cleveland, O., in order to meet the demand for high-powered runabout cars, has decided to supply for the 1908 market a six-cylinder runabout carrying a nominal rating of 45-horsepower, but which is claimed under brake test to show from 90 to 100 horsepower. This new model follows practically every principle used in the present four-cylinder car excepting, of course, such changes made imperative by adding a pair of cylinders. As in the touring car these cylinders, cast in pairs, have a bore of 5 $\frac{3}{8}$  inches and a stroke of 5 $\frac{1}{8}$  and the Stearns practice of carrying the crankshaft on ball bearings is used. The ignition system is a double one, combining a high-tension Bosch magneto and a storage battery. Flexible connection with the motor and the transmission is through the well-known Stearns expanding band clutch. Speed variations are through a four-speed and reverse selective gearset with final communication by way of side chains. Thirty-six-inch wheels in front and rear take regularly 4 and 4 $\frac{1}{2}$ -inch tires; the wheel-base is placed at 128 inches, the tread is 54 $\frac{1}{2}$  inches and braking is through contracting bands on the countershaft and expanding brakes within rear wheel drums. Pursuing its usual practice, the company uses its semi-elliptic springs and links the front pair at their forward end to the down-curved ends of the frame. In accommodating the standard chassis parts to its three-passenger roadster body a few changes were imperative, foremost among which were those of raking the steering column a little and accommodating the side levers to the seat. The bonnet, made severely plain, is continued rearward in the form of a funnel-shaped dash. The fenders are rational affairs and the rumble seat is conventional. The first of these runabouts have been out for several weeks, having already participated in several of

the summer contests. In supplying mixture recourse is had to the Stearns two-jet carbureter, previously described in these pages and which carries as its attractive feature two jets, one for slow running and the other intended for speeds above a predetermined limit. The throttle, controlling both nozzles is subject to one control.

## TRAVELER, A NEW CAR

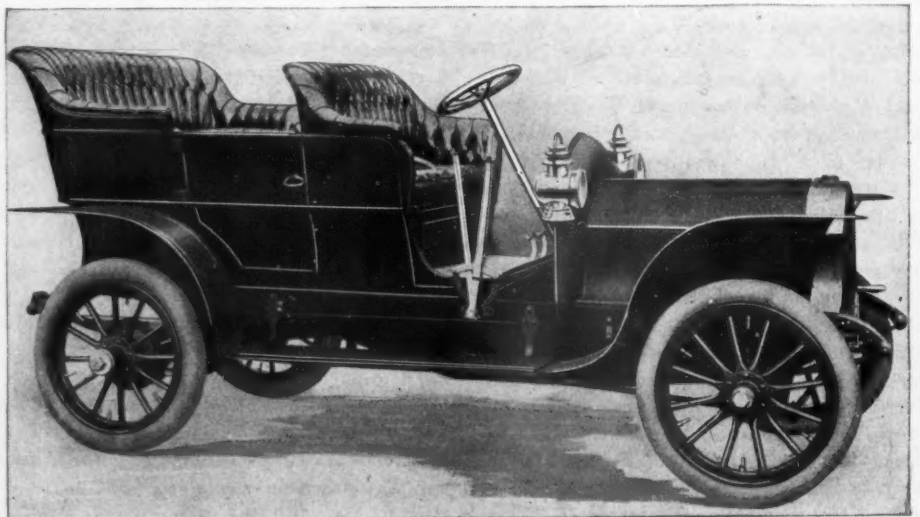
Bellefontaine, O., has come to the front in the motoring world through the efforts of the Bellefontaine Automobile Co., which has placed on the market two models of its Traveler cars, designated respectively models A and B, the former air-cooled, the latter water-cooled. The following paragraphs refer to the water-cooled car which follows conventional four-cylinder design with a cone clutch, sliding gear transmission, universally-jointed propellershaft and floating ball-bearing rear axle constituting the transmission system.

The motor used in the Traveler follows very closely the lines of those in the Continental motor in that it uses cylinders



RIGHT LAMP STRAIGHT ON LEFT TURN

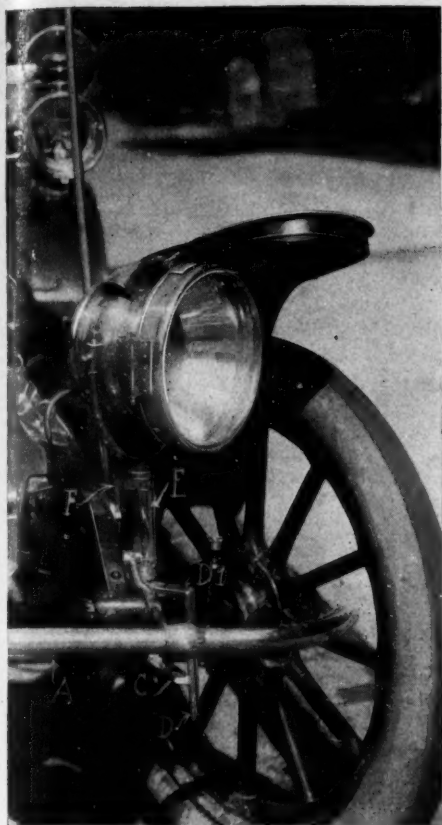
cast in pairs with valves located in the bottoms of integral chambers on the left side, one camshaft sufficing for both sets of valves. Forming the crankcase are two aluminum castings, the upper one carrying the three-bearing crankshaft, the lower doing duty as an oil reservoir. The half-time gear on the forward end, together with the crankshaft pinion, is enclosed, operating constantly in oil. The commutator and pump, located between the fourth cylinder and the dash, are carried on a vertical shaft, the pump on a level with the top of the crankcase, the commutator higher than the cylinder tops. Intake and exhaust manifolds are one-piece castings secured to the cylinders by a common yoke for the front pair and an-



TRAVELLER FIVE-PASSENGER WATER-COOLED CAR

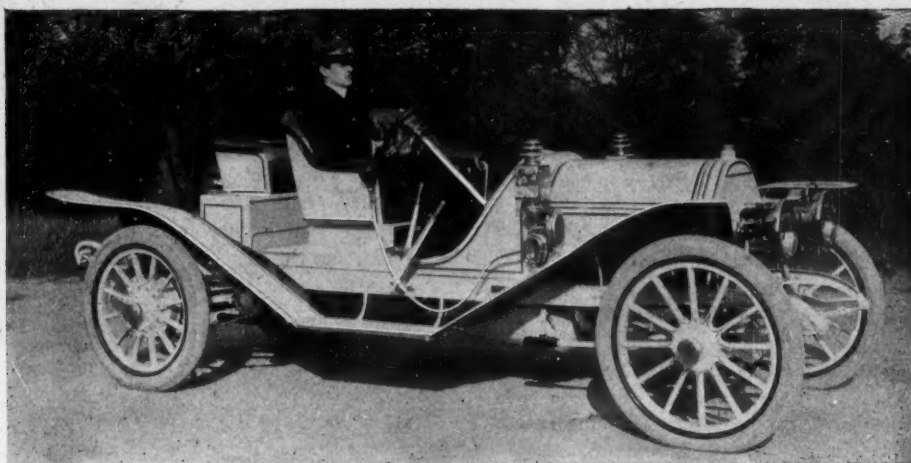


# A MANUFACTURERS MEDLEY



LEFT LAMP SWUNG ON LEFT TURN

other for the rear pair of cylinders. Water enters the valve chambers at their lower centers and the return flow is from the cylinder tops. This motor, rated at from 28 to 32 horsepower, is made with  $4\frac{1}{4}$  by  $4\frac{3}{4}$ -inch cylinders. The rated speed is estimated at 900 revolutions per minute, but the motor is capable of a flexibility ranging between 100 and 1,800 revolutions per minute. The interiors of the cylinders, after being bored and reamed, are ground to a finish and when the motor is completely assembled it is run for several hours so as to give a polished cylinder surface. Concerning the different parts of the cylinder it might be noted that the crankshaft is a steel drop forging specially tempered; valves, made inter-



BERLIET 40-HORSEPOWER THREE-PASSENGER ROADSTER

changeable, are chrome nickel steel pieces; connecting rods are drop forgings of H cross section, having marine type lower ends and adjustable at the wristpin end; wristpins are of steel, case-hardened, and the three crankshaft bearings are of white bronze. Assisting in the water circulation is a tubular radiator, gear-driven pump and fan. Ignition is by jump spark with current supplied from a set of dry cells, with another set held in reserve, the current passing en route to the plugs through a quad coil. Particular care has been given to motor lubrication by carrying on the right front arm of the motor a seven-feed oiler driving it by eccentric off the camshaft. These leads, after passing through sight feeds on the dash, find their way to the cylinders and other important portions of the motor.

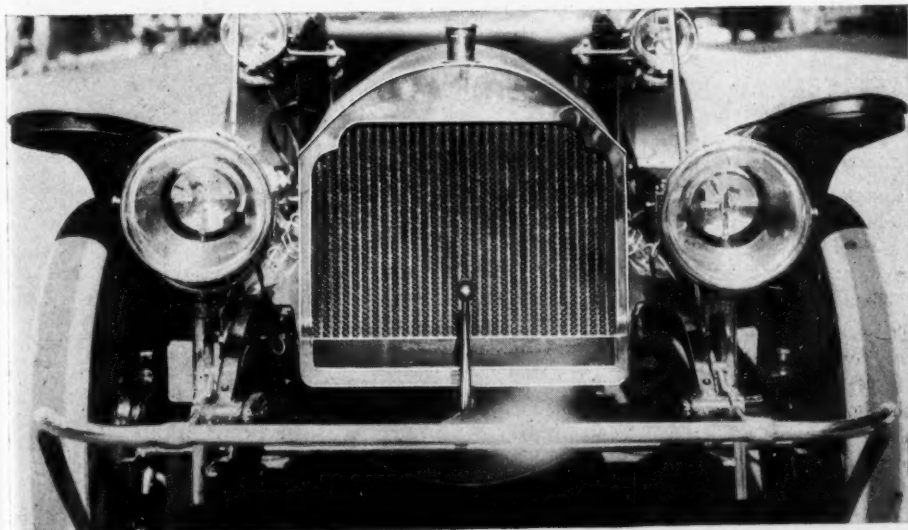
Being content with tried constructions rather than introducing innovations in its transmission system, the company uses a leather-faced cone clutch in the flywheel which is interconnected with the gear-shifting lever, making it impossible to

shift gears with the clutch engaged. The clutch also is connected with the external foot-operated rear wheel brakes in that the application of these brakes first throws out the clutch. The sliding gearset affording three forward variations and one reverse, operates on the progressive principle and has direct drive on the high speed. The gear-shifter bar is enclosed in an extension at the right of the case and the gearcase as well as the motor finds its support on the subframe of the car. Between the clutch and transmission is a universal joint and at the forward and rear ends of the driveshaft are similar joints. Ball bearings carry all parts of the rear axle as well as the front wheels. The emergency brakes are internal members acting within the rear wheel drums and are applied by side lever.

Combined in the Traveler running gear is a series of standard parts in which are I-beam front axle with jaw endings for taking the steering pivots; pressed steel frame assisted by subframe for carrying the car parts; semi-elliptic springs, 44 and 48 inches in length in front and rear; worm and sector steering gear carrying throttle and spark controls and concave metal dash. The wheelbase measures 104 inches; wheels are 32 inches in diameter and carry  $3\frac{1}{2}$  by 4-inch tires.

## SEARCHLIGHT THAT SWINGS

When turning a corner to the right with a car carrying the Haldeman automatic searchlight the right lamp is turned to the right, thereby lighting up the curve while the left lamp points straight ahead. This arrangement gives a full corner illumination. Similarly, when turning to the left, the left lamp is turned while the right points straight ahead. The attachment of this swinging device for headlights is exceedingly simple and permits of carrying the headlights in the same position at the sides of the radiator that they generally occupy. For each lamp a bracket with a

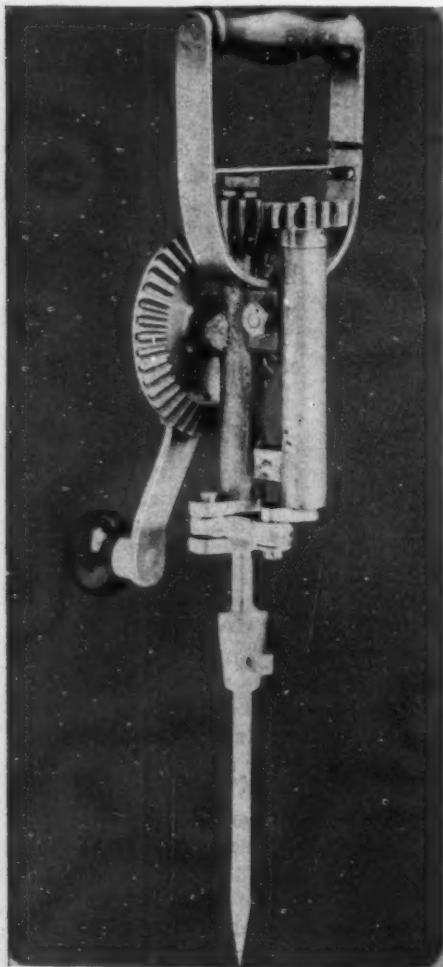


BOTH LAMPS STRAIGHT AHEAD WHEN GOING STRAIGHT

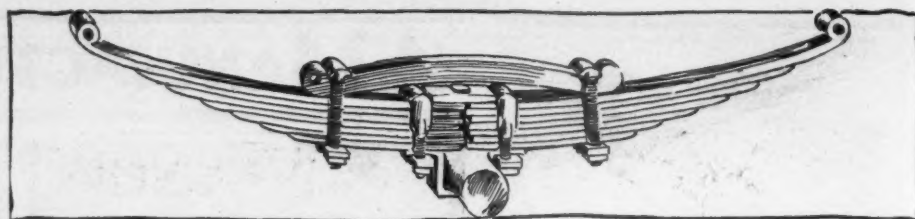
two-point bearing forming the support for the light is fastened to the side of the frame. Between the bearing points is an adjustable spring for bringing the light back to its front position after it has been turned right or left in making a corner. The operation of the lights is caused by arms C and B extending forward from the tie rod A, uniting the steering knuckles of the car. These arms come in contact with other arms D extending downward from the bracket D1. As the arms B and C are inside of the arms D it follows that in turning to the right the arm B contacts with the arm D but the arm D on the left leaves the arm C, thereby turning the right light, but leaving the left one straight. In making a left turn the action is directly opposite. O. E. Haldeman, Marion, Ind., manufactures them and has for some time had them in use.

### VALVE GRINDER THAT'S SIMPLE

One of the simplest and easiest operated valve grinders yet given to the public is the Jef, taking its name from the initials of John E. Fry, its inventor. The Jef, after the design of the pioneer egg-beater, for years considered an indispensable household utility, is a little machine which when in use is held in one hand while the other is used in operating it. Motorists are aware that in grinding valves the valve must be given a part revolution in



GEARING OF JEF VALVE GRINDER



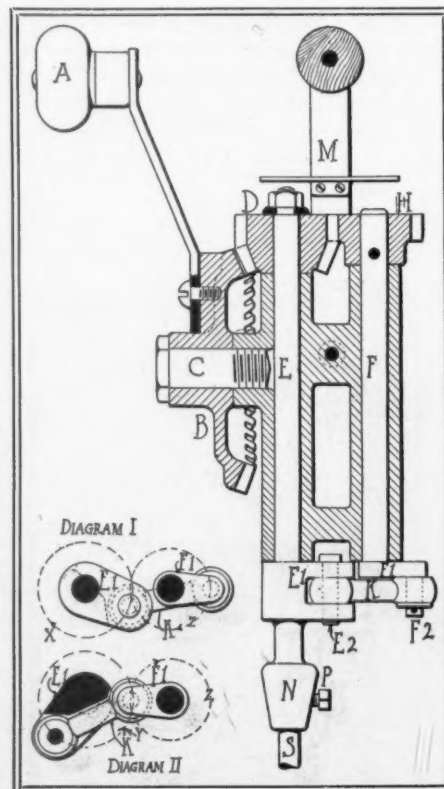
SPRING REPAIRER ATTACHED FOR BROKEN CENTER REPAIR

one direction on its seating followed by an equal movement in the other direction, which pair of movements is continued until the valve has a perfect fit on its seating. In the Jef this back-and-forward movement—this half-turn of the valve in one direction and then followed by a half-turn in the opposite—is accomplished in an ingenious but decidedly simple manner best explained by a survey of the two illustrations of the instrument and also by the sectional drawing of it. In the sectional illustration A marks the handle for operating the grinder, it having connection with a large bevel gear B loosely mounted on stud C carried in the framework of the grinder. The gear B meshes with a double spur-bevel pinion D loose on the upper end of the vertical rod E. Through its spur gear portion it transmits motion to the spur pinion H pinned to the upper end of another vertical rod F. The screwdriver for fitting into the top of the valve is marked S and is secured to the lower end of the rod E by fitting into an expansion N and being anchored therein by setscrew P. In grinding a valve the screwdriver portion S has to be given the back-and-forward motion already referred to. The explanation of how this is accomplished follows: On the bottom of the rod F is an offset or crank F1 and on the bottom of the rod E is a similar offset E1. The offset E1 is slightly longer than the offset F1. This is the key to the back-and-forward movement of the screwdriver S. A connecting rod K connects F2 and E2 on the offsets. Turning the handle A drives the shaft F through gears D and H. The shaft F drives shaft E through connecting rod K, it being understood that the gear D is loose on the shaft E and so does not turn it. The shaft F with its offset F1 revolves steadily like the crankshaft of a motor, but offset F1 being shorter than offset E1, as shown in diagrams I and II, the offset E1 is first carried in one direction, as shown by the arrows X; but the offset F1 is too short to let it complete the circle of revolution it would follow—the dotted portion of the circle showing that not traveled—and it is pulled backward as marked by arrow Y in diagram II. All this time the offset F1 on shaft F is, however, revolving in its circle marked Z in both diagrams I and II. With this machine the handle A can be turned either way as fast as possible, there being no perceptible jerk with the back and forward movement of the screwdriver S. There is no limit to the speed at which it can be operated. The handle M allows of holding the ma-

chine vertical, insuring perfect grinding. By the use of this machine the time required in grinding a valve is reduced by more than one-half. All inquiries regarding the Jef grinder should be mailed to the Jef Mfg. Co., which is located at 1562 Broadway, Denver, Col.

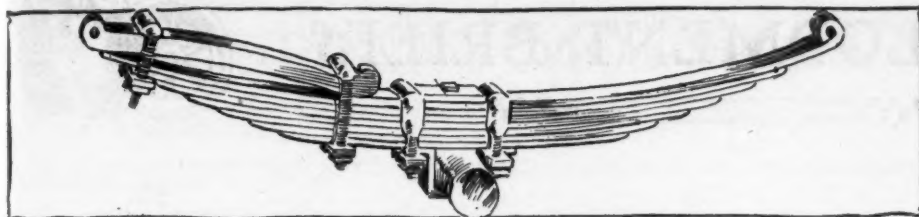
### EASY SPRING REPAIRING

Considerable attention was attracted during the show circuit last winter by a simple spring repairer marketed by the Auto Spring Repairer Co., 54 Maiden Lane, New York city. This repairer consists of a slightly arched piece of steel made with rounded ends and resembling to some extent a miniature inverted spring leaf. It is generally supplied in lengths slightly less than half the length of the spring and furnished with it is a pair of clips for attaching it. Its attachment to a broken spring is shown in the illustrations, one of which depicts it caring for a central break and the other where the break is in one half the spring. For the central break it is placed on top of the center of the spring and secured thereto by a clip at either end, but where the break occurs in one-half the spring it reposes on that half and attaches by means of two clips. The clips for fastening it are adjustable and will take



SECTIONAL VIEW OF JEF VALVE GRINDER





SPRING REPAIRER ATTACHED TO SPRING FOR SIDE BREAK

any spring up to 5 inches in thickness. As these clips are threaded their full length the clips will serve for springs of any thickness less than 5 inches.

#### ARCHER A NON-PNEUMATIC

The Archer is a non-pneumatic tire, manufactured by the Archer Auto Tire Co., Marion, O., and intended for use on pleasure or commercial motor cars. The side view of a wheel fitted with this tire reveals the outer rim, A, carrying a rubber tire, B, a series of six rubber blocks, C, separating the outer rim from the inner rim, D, and a series of three anti-slip devices, E, all of which will be referred to in detail. This tire can be attached to any size of wheel. It is necessary to remove the curved rim used for clincher tires and substitute a flat auxiliary rim, but where flat rims are originally used a change is not necessitated in attaching the Archer tire. As shown by the cross illustration of the tire, it consists of a double-flanged open hearth steel rim, F, varying in width and depth according to the width and depth of the tires required. Its channel is filled with a wood filler, H, over which is cemented the tire tread, K. This tread has a rounded appearance, yet no sloping sides; having first a high center or rudder band with vertical sides,

the surface receding in graduated steps from the center to the sides. This allows of the use of lateral cleats for increasing adhesion. In passing over hard pavements the high center carries the wheel and in passing over soft places the cleats engage in the soft road. The graduated steps, with vertical sides, are claimed to greatly reduce side slip. This solid rubber tire affords a measure of resiliency, but the real part of the wheel giving resiliency is the series of six perforated india rubber cushions, C, spaced regularly around the wheel periphery. Any number of these cushions may be used, six being sufficient for a 1,600-pound car. The form of these cushions, C, is such as to give the greatest eccentric action to the inner or spoke portion of the wheel. Each of the six cushions may be removed by loosening two nuts and taking out one bolt. This is accomplished by means of metal plates, which are vulcanized fast to the cushions in the molding process. These metal plates form the base to which the rim clamps attach. To prevent side slip the series of three linkages, E, between the rim carrying the tire and the rim on the ends of the spokes is used and as seen in the sectional portion of the illustration they consist of a bracket, M, riveted to the outer rim, another bracket, N, riveted to the inner rim and a link P, which unites at its ends with the brackets M and N through ball and socket joints. The object of this device is that when double rims are used on wheels the tendency of the broad tire to "lay over" when turning a corner under speed causes side slip and end thrust on the axle. This device permits of the broad tire traveling flat on the road surface in making turns in that sufficient compensation for this is afforded, these devices also preventing lateral displacement of the outer rim.

#### MOTOR CAR LITERATURE

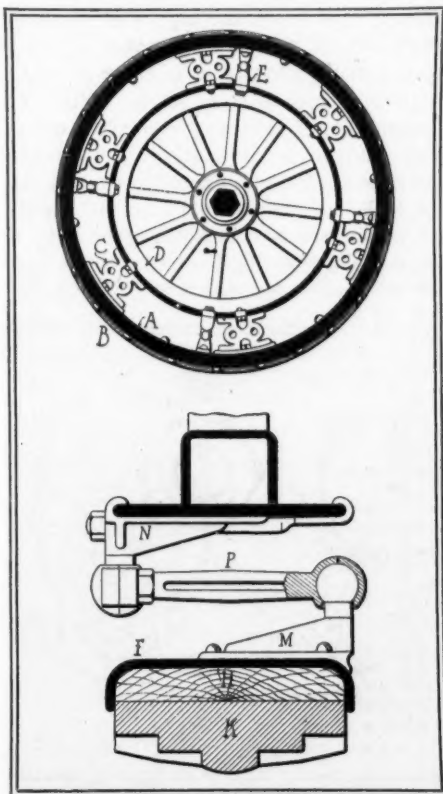
"Motoring Annual Illustrated and Motorist's Year Book" for 1907, issued by Motoring Illustrated, 11 Arundel street, Strand, London, W. C., England, is a 546-page cloth-bound volume brimful of everything relative to motoring in the British Isles. It opens with a 100-page biography of the leading motorists, telling in paragraph form their business relations. Following this is a synopsis of the various motoring bodies throughout the country, mentioning the contests conducted by each and the winners. Following this is a general resume of the racing events of the season in the motoring and motor boat

field. Complete details are given on all European contests of the year, describing the course and mentioning the winners in each case. In the last part of the book is a list of hotels throughout Great Britain especially suitable for motorists. The book contains a comprehensive index and is a perfect encyclopedia of motoring in England, Ireland, Scotland and Wales.

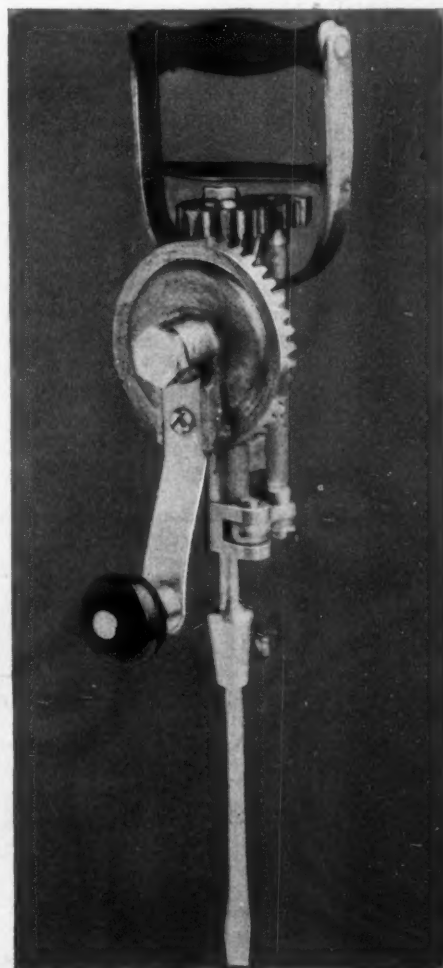
The Pratt & Whitney Co., Hartford, Conn., toolmaker, is circulating a 200-page catalog on its small tools in which are included taps and dies, bolt and pipe threadings, milling cutters, splitting saws, lathe tools, twist drills, boiler punches, reamers, taper pins and ratchet drills. A page is given over to each tool, the general scheme being to illustrate it in the upper portion and print a schedule showing its size and price in the lower half.

Billings & Spencer are out with a very neat pocket-size book illustrating their many styles of machinists' tools, including wrenches, hammers, ratchet drills, tool holders and gauge blanks. They are also distributing a booklet on the fine tools and specialties which include calipers, caliper gauges, depth gauges, micrometer holders, screw drivers and small wrenches.

"Factory Oil Storage," from S. F. Bowser & Co., is a small booklet in which is shown diagrammatically the method of storing oil in factories according to the Bowser system.



ARCHER TIRE AND SECTION OF IT



THE JEF VALVE GRINDER

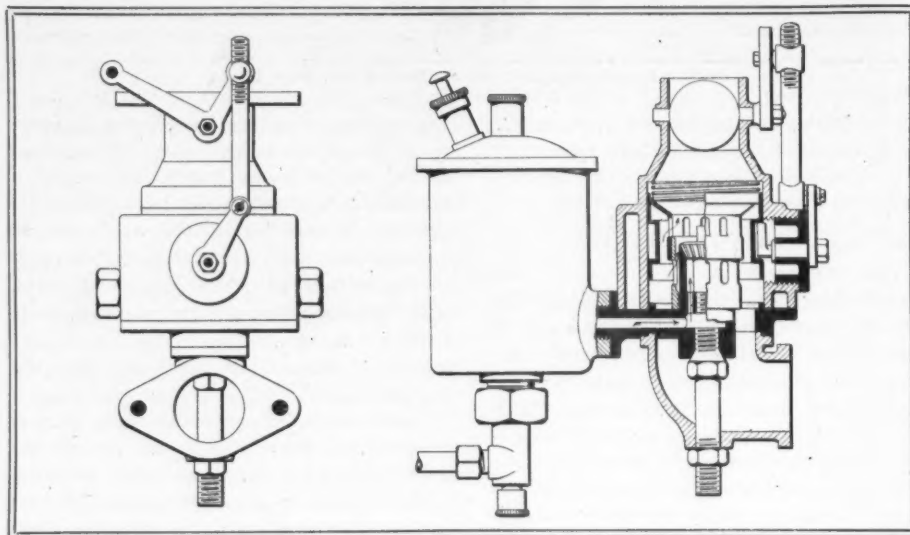


## DEVELOPMENT BRIEFS



### LATEST EUROPEAN CARBURETERS

In a recent issue the Autocar refers to the latest style of Longuemare carbureter, which comes from that famous French factory deservedly known as the international home of carbureters. As illustrated the feature in this carbureter is the method of regulating air so on high speeds too great suction will not occur around the spraying nozzle and so draw out too much gasoline, giving an over-rich mixture. The old Longuemare did this by providing manual controls for the throttle and air entrance so the driver when he opened his throttle could open his air entrance correspondingly. In the new model this double manual control is discontinued and by one control the throttle and air are now regulated. This is done by furnishing a bypass so on slow speeds all of the entering air passes close to the nozzle and on high speeds the bypass is opened, allowing air to enter direct into the mixing chamber without its passing close to the spraying nozzle. The sectional illustration shows how this is accomplished. The nozzle through which the gasoline enters from the float chamber has a large knurled end which compels the gasoline to pass out through the furrows or knurls in its enlarged ending, thus breaking it up into very fine streams. At the bottom of the nozzle is screwed a vertical tube with air openings surrounding the jet. On this tube slides a telescoping tube pierced by openings which are higher up than the jet. This tube also is joined to a cylindrical portion which acts as a guide within the carbureter casing. In it is a recessed portion in which works a cam carried on a short shaft. By working the came the telescoping tube can be raised or lowered. Connected with the shaft is a connecting arm which links through a connective with the butterfly throttle, being adjustable therewith through a bracket. All parts are retained in their respective

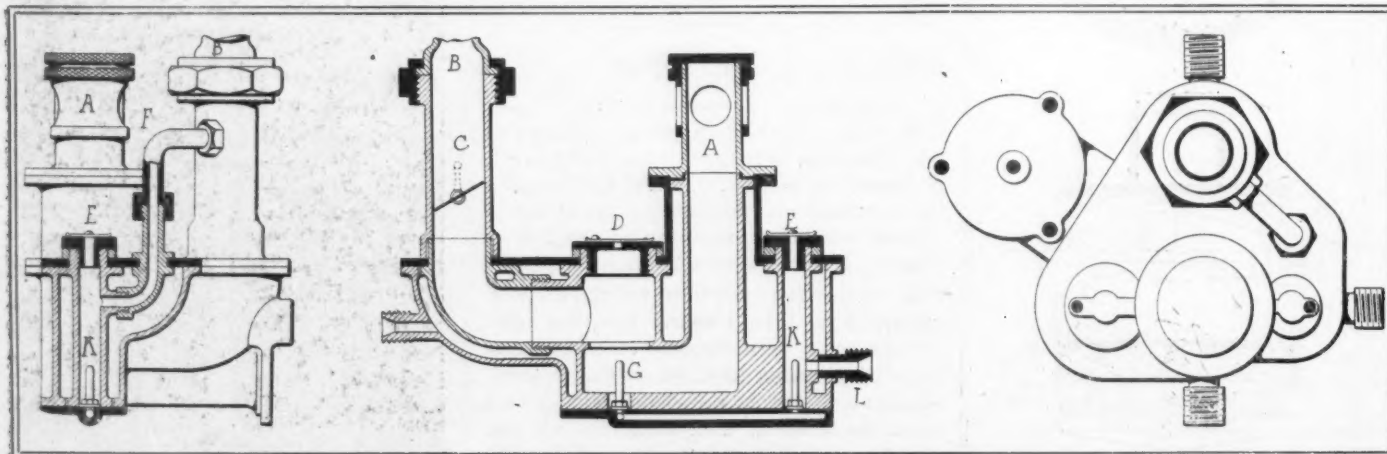


LATEST LONGUEMARE AUTOMATIC CARBURETER

positions by a spring. An upward movement of telescope tube uncovers the lower air openings, thereby admitting air, which enters by way of a channel, passing close to the nozzle as indicated by the arrows. Moving the tube still higher, higher openings are uncovered as they rise above the top of the small tube. Through them air enters above the nozzle and so exerts but little suction on the gasoline in the nozzle. This regulation conforms with the throttle adjustment, giving a good rich mixture on low speeds and on high speeds admitting a greater proportion of air than gasoline. If all entering air on high speeds had to go through lower openings the rate of air current past the nozzle would be so great as to literally drink the gasoline out of the nozzle, but sidetracking or bypassing some through upper openings the rate of flow past the nozzle is not increased.

For 2 years C. G. V. cars have been fitted with two-jet carbureters which have remained unchanged during that time and air in the passage A-G-B.

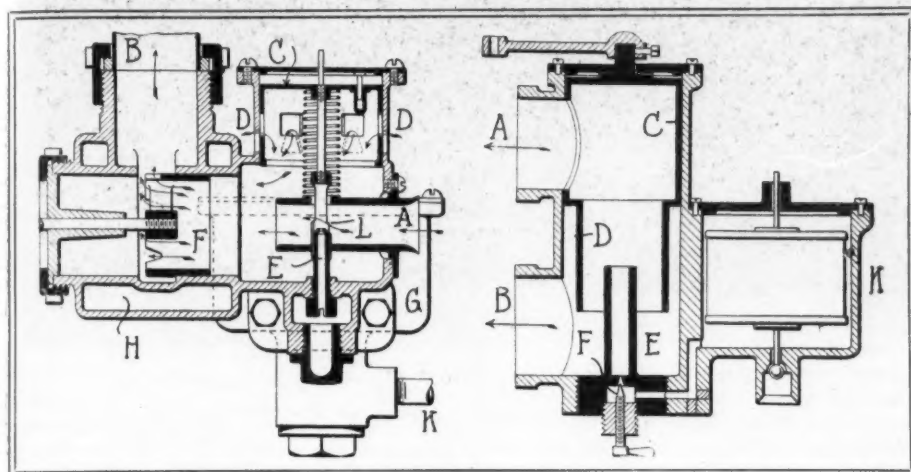
which the maker claims offer exceptional flexibility of the motor. The two sectional illustrations show the two gasoline jets, a small one K and a large jet G, both supplied with gasoline from the same float chamber, which maintains an even level in both. The action of the big jet G is due to air entering passage A and escaping to the motor past a butterfly throttle C in the induction pipe B leading to the motor. Air for the small jet K enters by an opening L and rising through a small-diameter pipe F enters the large induction pipe B above the throttle C. When the butterfly throttle C is closed the big nozzle G is entirely out of use and the motor operates by the small quantity of mixture it draws in through pipe F from jet K. With the throttle C open then all the mixture comes from the big jet G in a manner already mentioned. With the throttle C open the nozzle K does not supply any fuel, as its air openings L and induction pipe F is of so small diameter that its air current cannot offset the opposition offered by the



THE C. G. V. TWO-JET CARBURETER AS USED CONSTANTLY FOR 2 YEARS



# CURRENT MOTOR CAR PATENTS



GRAY'S AUTOMATIC CARBURETER

THE JENNESS CARBURETER

**Large-Nozzle Carbureter**—No. 855,179, dated May 28; to P. Jenness, Philadelphia, Pa.—Featured in this carbureter is the large vertical cylindrical spraying nozzle E to which gasoline is admitted from the float chamber K past a small conical needle valve F in the base of the nozzle. The nozzle E having this small entrance past valve F and the large top or exit, there is offered a large volume of gasoline in it above the valve F for the intruding air to draw upon. Air entering opening B passes upward through the lower part of the throttle C which forms a strangle tube D enclosing the upper portion of the nozzle E. Its escape to the motor is by way of opening A. A line marks the approximate gasoline level in the nozzle E which shows the amount of gasoline always in the nozzle above the valve F. In most carbureters the valve F is in the top of the nozzle, thereby offering but a very limited quantity of free gasoline above the valve.

**Triple Tire Tread**—No. 855,199, dated May 28; to J. Partington, Saltaire, Eng.—Instead of one broad tire fitted to the wheel rim there are placed side by side

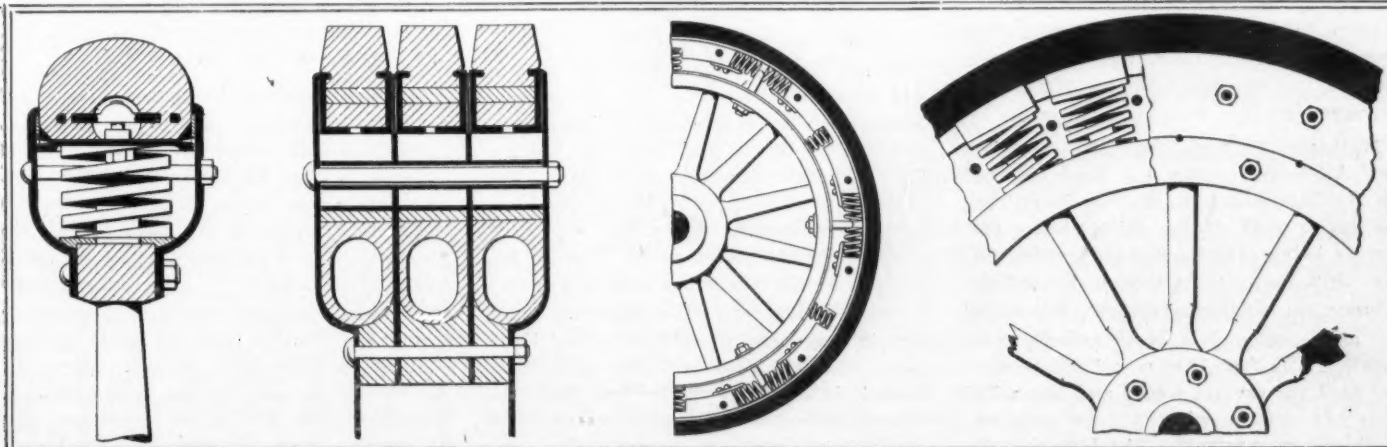
three separate tires of less than one-third the width the single tire would be to make a given tire width. These tires, instead of resting directly on the wheel rim, are separated from it by a series of three chambers with large internal cavities for giving resiliency. These separating bodies rest in corrugations or cavities of the rim and together with the three tires are secured against lateral movement by deep side flanges. The several tires are held to these flanges by cross bolts.

**Fuel Regulator**—No. 855,170, dated May 28; to B. D. Gray, New York city—The normal air opening A in this carbureter has the fuel nozzle E projecting vertically into it. Mixture is under control of the sliding barrel throttle F before passing through opening B to the motor. Auxiliary air enters by virtue of the spring-controlled valve C which uncovers and covers opening D for air admission. K marks the gasoline entrance into the float chamber and G and H designate waterjacketing spaces for the mixing chamber. The feature of the patent is a hood L attached to the auxiliary air valve C, and which partly covers the nozzle E. As the valve

C rises and falls according to the dictates of motor requirements this hood also rises and falls, thereby making the nozzle exit proportionate to the amount of auxiliary air admitted. The adjustment between the hood and auxiliary valve is such that no matter what the speed the mixture proportion remains constant. One adjustment suffices for the air and gasoline, as both are automatically controlled. The only control is that of the throttle.

**Spring Rim**—No. 855,095, dated May 28; to J. W. Cooper, Boston, Mass.—This rim consists of a pair of concentric rims, the smaller-diameter rim fitting onto the outer ends of the wheel spokes and the larger-diameter rim carrying the rubber tire. Separating these rims is a series of radial springs, there being double the number of springs than spokes. The inner ends of the springs fit over short stub spokes projecting beyond the inner rim and the outer ends of the springs fit over similar short projections on the inner side of the outer rim of the wheel.

**Spring Wheel**—No. 854,982, dated May 28; to S. S. Childs, Bernardsville, N. Y.—Resiliency is accomplished in this wheel by using two concentric rims separated by two series of spiral springs. One set of springs, placed radially and alternating with the spokes, absorbs the jar and the other set is arranged circumferentially in pairs in the inner side of the outer rim with their adjacent ends separated only by the end of a radial arm that is carried on the inner rim. These springs are for absorbing the torque jar because when the spokepart of the wheel with its inner rim starts to revolve the revolving force is transmitted to the outer rim through the radial arms and through the circumferential coil or spiral springs. The springs in this wheel are of small diameter and very short, and there are only half the number of radial springs that there is wheel spokes. The rim is much smaller than used in many spring wheels.

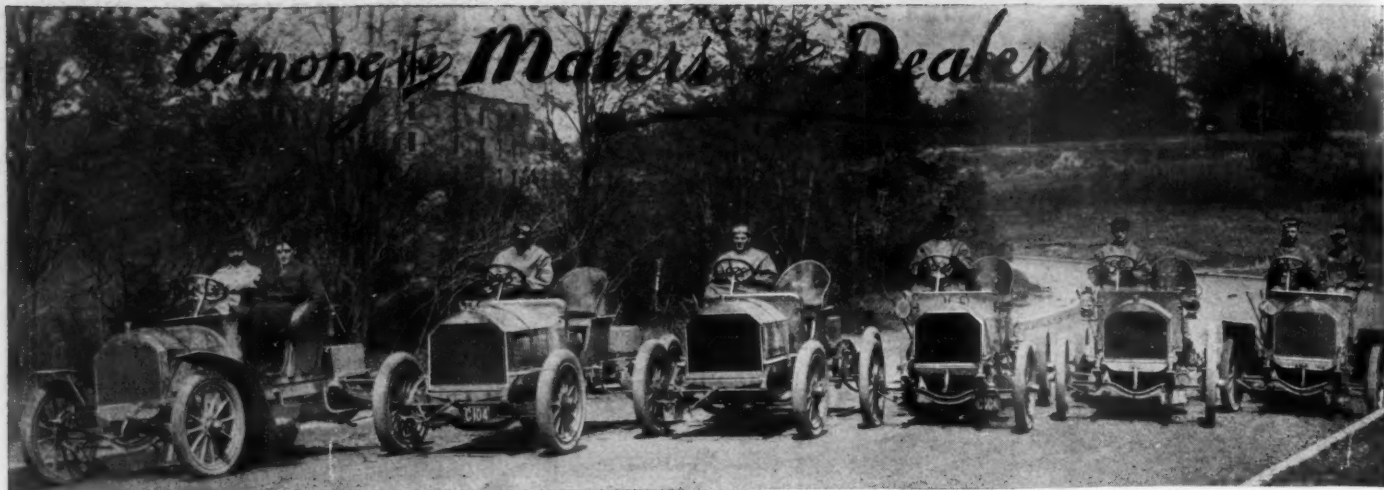


THE COOPER RIM

THE PARTINGTON TIRE

CHILD'S RESILIENT WHEEL

COOPER'S RESILIENT RIM



COLUMBIA TESTERS LINED UP FOR START OF STRENUOUS DAY'S TRIP ON THE ROADS

**Has a Big Place**—The Seattle Auto Co. has moved to its new garage, 1423-25 Tenth avenue, Seattle, Wash. This is the largest garage in the Pacific northwest.

**Sprecher Changes** — Orville Sprecher, formerly vice-president and superintendent of the Prest-O-Lite Co., has joined forces with the Avery Portable Lighting Co. and will be located in Milwaukee.

**O'Brien Not With Wayne Now**—It is announced that J. H. O'Brien is no longer connected in any way with the Wayne Automobile Co. The manufacturing end of the company now is in charge of Thomas F. Ahern, formerly of Cleveland, who has moved his family to Detroit and taken up his residence there.

**Ford Runabout Production**—Manager Thomas Hay, of the Chicago Ford branch, was notified Tuesday that at that time there were 6,668 Ford runabouts on the road, all put out in less than a year. The company still has a month and a half in which to reach the 10,000 mark, which it originally set for the first year.

**Change in Owen's Chicago Branch**—L. J. Ollier, manager of the Chicago branch of R. M. Owen & Co., has resigned his position to go to Los Angeles, Cal., where he will act as manufacturers' agent, handling principally the Excelsior Automobile Supply Co.'s goods. Mr. Owen came on to Chicago Tuesday and appointed as successors to Mr. Ollier his brother, Otto Owen, and S. M. How, who jointly will manage the Chicago business of the Reo and Premier.

**Matheson Through for 1907**—The last 1907 Matheson chassis has been received by the Matheson Co. of New York, and the entire work of the Wilkes-Barre factory is being directed toward getting out the 1908 product. Although no definite information has been given out, it is stated the only changes will be in refinement of details. The first 1908 model has been on the road for several weeks and has rolled up a big mileage without developing any weak points, it is said. The Matheson Co. of New York, which handles the entire out-

put of the Wilkes-Barre factory, already has disposed of three-fourths of the 1908 product to its agents throughout the country, it is stated.

**Top Concern Thriving**—The London Auto Supply Co., of Chicago, now located on Michigan avenue, Chicago, is contemplating moving into larger quarters at Wabash avenue and Twenty-third street in the fall. At present the concern is turning out tops at the rate of 250 a month and glass fronts at 125 a month.

**Splitdorf Moves**—The Splitdorf laboratory, for many years located at 17-27 Vandewater street, which is in the heart of downtown New York, has moved almost to the other end of the city—261-265 Walton avenue, corner of One Hundred and Thirty-eighth street, in the borough of the Bronx. The new plant is a six-story and basement structure of the latest fireproof construction. It has a total floor space of over 50,000 square feet, every foot of which will be utilized by the Splitdorf laboratory. One important feature is the installation of the Edison breakdown system which can be thrown in at a moment's notice, thus insuring uninterrupted work.

**Big Buffalo Concern**—Another decided step in the progress of the retail trade in Buffalo has been taken by the recent opening of the showrooms of the Imperial Motor Co. at 1094-1100 Main street. The company has a contract to handle the Packard, Buick, Pope-Hartford, Tribune and Babcock electric. The Imperial Motor Co. has contracted to handle the local allotment of the Babcock Electric Co., of Buffalo, for the next 2 years. The building of the Imperial Motor Co. is located in a section of the city especially adapted for the motor trade. The lot has a depth of 436 feet, thus affording plenty of room at the rear. The structure is 150 feet in length, is of solid brick and is divided into four sections. The main showroom is in the front on the first floor, and directly above is the department in which second-hand cars are shown. The rear division on the first floor is used as a ga-

rage. C. B. Penney is president of the company and the secretary is W. R. Densmore, formerly a representative of the Packard Motor Car Co.

**May Dissolve Company**—A meeting of the stockholders of the Oneida Automobile Co. will be held at Oneida, N. Y., June 18 to vote on a proposition that the company be dissolved at once.

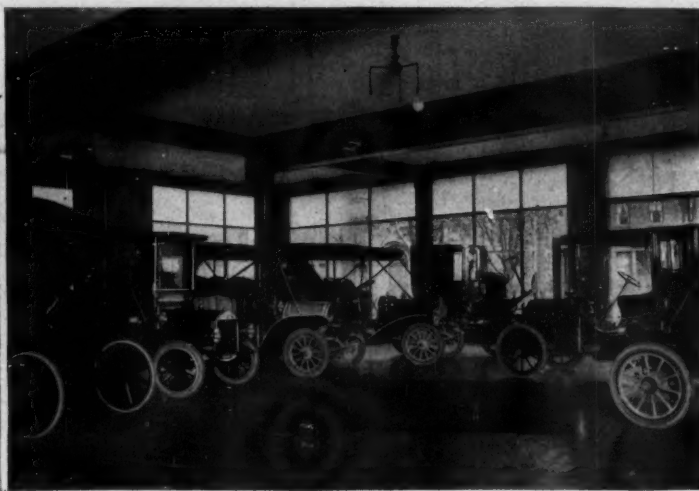
**From Rambler to Dragon**—Edward H. Cushman will become traveling representative of the Dragon Automobile Co., New England branch, 117 Massachusetts avenue, Boston, Mass. Mr. Cushman was identified with the Rambler in New England for some time as traveling representative.

**Fisk Doings**—The Fisk Rubber Co. has added to its staff a man from each of the leading European and American tire factories. In addition comes the news that the company's experts have discovered a new process for the curing of rubber, which will greatly add to the toughness and wearing qualities of its tires.

**Pittsburgers Elect Officers**—The Pittsburg Automobile Dealers' Association has elected these officers for the coming year: President, W. N. Murray, of the Standard Automobile Co.; vice president, W. H. La Fountaine, of the Atlas Automobile Co.; secretary and treasurer, A. L. Banker, of the Banker Brothers Co. The association will maintain permanent offices on the second floor of the Standard Automobile Co. in Baum street, east end.

**Maxwell Function Postponed**—The date for the corner-stone laying of the Maxwell-Brisco plant at Newcastle, Ind., has been changed to June 22. It is stated that the date was altered from June 8 because of the serious illness of the mother of J. D. Maxwell. Vice-President Charles W. Fairbanks will be one of the principal speakers and several hundred motor car manufacturers and dealers from all parts of the country are expected to attend. The ceremonies will include, besides the address of Vice-President Fairbanks, speeches by Judges Bundy and Forkner and C. S. Hernley. The ceremonies will begin at 2 p. m.,





EXTERIOR AND INTERIOR OF THE STORE OF THE IMPERIAL MOTOR CO. ON MAIN STREET, BUFFALO

at which time several lodges and societies will assemble at the courthouse square and from that point proceed to the scene of the building operations.

**Will Build at Berwyn**—The Carter Motor Car Corporation, of Washington and Detroit, is receiving estimates for a brick and concrete factory building, 206 by 58 feet, to be erected at Berwyn, Md.

**Middleton Joins the Dragon**—J. C. Middleton, for several years connected with the sales department of the Autocar Co., of Ardmore, resigned last week to accept a place as assistant sales manager of the Dragon Automobile Co.

**Autocar Has Baseball Team**—The Autocar Co., of Ardmore, has a crack baseball team in the field, made up entirely of employees. It is cutting a wide swath in amateur circles in and around the Quaker City, not yet having suffered a defeat.

**Houpt Opens in Philadelphia**—The new Philadelphia quarters of the Harry S. Houpt Co., at 139-141 South Broad street, across the street from the Union League and but a stone's throw from the Bellevue-Stratford, were formally opened last Saturday. That concern, which handles the Thomas line in New York, will represent the same make of cars in the Quaker City. Andrew S. Robinson, a former Philadelphian and long associated with the New York house, has been appointed as manager of the new place.

**Columbia Testers**—If one were to happen in the vicinity of the Electric Vehicle Co.'s works at Hartford he would observe from time to time numerous test cars darting in and out of the big iron gate. Invariably the man at the wheel is bespattered with mud from head to foot and one hardly knows whether he is a white man or an Ethiopian. He is a tester. Each member of the Columbia test crew has his work to do and he does it without any fuss. His efforts are of practical value and he proves the worth of this or that feature of construction. He cares little whether he is covered with mud or how hilly or rough the roads are. He tunes a car to concert pitch.

The Columbia drivers include such veterans as D. C. Lull and Lawrence Duffie, both of whom helped to establish the Chicago-New York road record.

**Two Recruits**—The Waltham-Orient and Corbin Motor Vehicle Corporation have made application for membership in the New York Automobile Trade Association.

**Suit Over Patents**—The S. F. Bowser Co., of Fort Wayne, Ind., has brought suit against the National Oil Pump and Tank Co., of Dayton, O., alleging infringement of patents held by the former concern. Both companies manufacture a tank said to be of similar appearance and this is the second suit that has been brought by the Bowser people. The case will be heard by Judge Thompson in the United States court at Cincinnati on June 28.

**Will Be at Jamestown**—A. Gary Carter, president of the Carter Motor Car Corporation, of Washington and Detroit, is in Norfolk, Va., arranging for an exhibit of its Carter cars at the Jamestown exposition. The several models made by the company will be exhibited and demonstrations of the engine idea of the company will be made for the benefit of the postoffice and war departments, both of which have representatives at Jamestown getting a line on motor cars for use in the postal service and for United States army purposes.

**Working at Bryn Mawr**—Work is progressing on the steel and concrete buildings to be used for the new factory of the Pennsylvania Auto-Motor Co. at Bryn Mawr, Pa. All the adjoining property has been secured and the plant will be arranged so that the raw stock will be taken in at one side of the factory from a railroad siding, and the finished product, coursing through the buildings, returning to the same siding. The company will install in the plant a unique device for testing out the cars to save them from the usual road test. All electric lights will be generated from the dynamo driven by one of its engines. The company also expects to run two or three of the departments

with its own motors. It is getting ready for 500 regular cars next year and expects to begin deliveries by the first of September.

**Will Liquidate Department**—Trustees of the Harrison Wagon Co., of Grand Rapids, Mich., have decided to liquidate the motor car department. In accordance with this plan they will dispose of all the machinery, the cars in stock and those now building. This department was recently inventoried at \$182,000.

**New in North Dakota**—Another instance of the growth of the industry throughout the western country is the incorporation of the Fargo Auto Brokerage and Auto Co. at Fargo, N. D., by A. J. Gehm, Edmond H. Probstfield and Fred C. Lau, all of the North Dakota city. The concern is capitalized at \$50,000.

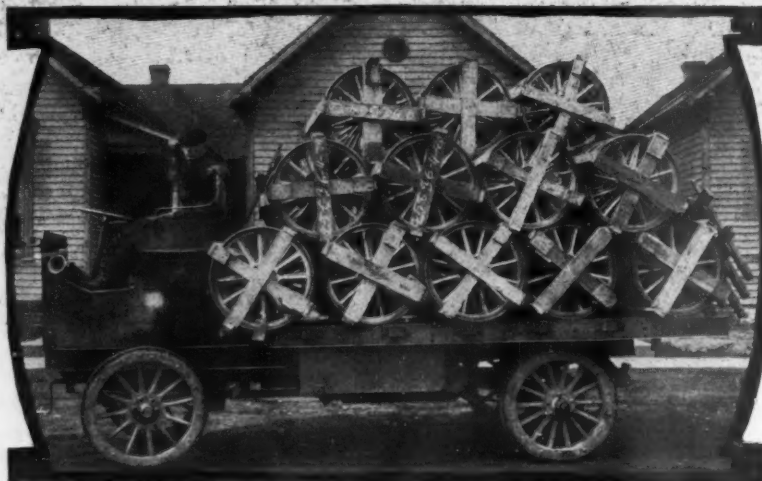
**La Fountaine Going West**—W. H. La Fountaine, founder and proprietor of the Atlas Automobile Co. of Pittsburg, has decided to give up the business in Pittsburg and join his wife in Los Angeles, where she has been for several months on account of poor health. Mr. La Fountaine was chairman of the Pittsburg show committee last spring.

**Fosdick May Go to New York**—Harry Fosdick, one of the pioneer dealers in New England, the first man to handle Winton cars in Boston, but who now has the Fiat and Thomas, is seriously considering an offer to go to New York and join the Hol-Tan forces. Mr. Fosdick is treasurer of the Boston Automobile Dealers' Association at the present time.

**Change in McDuffee Company**—The McDuffee Automobile Co., of Chicago, agent for the Stoddard-Dayton, De Luxe and Kisselkar, was recently reorganized, and it is announced J. H. McDuffee has severed his connection with the concern. This, coupled with the recent death of President George E. Harvey, caused the reorganization. Mr. McDuffee now is in Watrous, N. M., where he went to build up his broken health.

# The Realm of the Commercial Car

USING a truck for factory drayage to and from the railroad depots, transporting finished cars to the shipping platform and doing the multitudinous other factory hauls has become accepted practice among many motor car builders, chiefly because of a desire to be consistent in the motor field and consequently relegating the horse from the factory confines. The Premier Motor Mfg. Co., Indianapolis, Ind., has done this for several seasons, but of late has been employing a new-model truck, one intended for 2-ton loads, but which is often forced to transport double this weight. This truck is the latest development of a series of tests extending over several years. Although the company does not intend at present manufacturing it for the market, it purposes continuing experiments in the hope of evolving as perfect a truck as possible. At present the truck is put to a variety of uses outside of its prescribed limits, one being the role of private car for the Premier baseball club every Saturday afternoon. On a number of occasions it has been converted into a sight-seeing wagon. It is equipped with the standard Premier 24-horsepower motor, sliding gear transmission and side chain drive to 30-inch wheels carrying solid rubber tires. In front it is mounted on semi-elliptic springs, but in the rear finds support in a three-piece platform spring system. In order to conserve wheel base and yet give ample load-carrying length it has the seat mounted over the motor and the footboard placed well in front of the forward axle. The steering columns given a slight incline, the dash



PREMIER TRUCK HAULING FACTORY LOADS

is a small vertical affair and all devices of oiling, taking on gasoline and doing all the necessary adjustments are quickly and easily done.

## USED ON PLYMOUTH TRUCKS

Two weeks ago the Plymouth trucks built by the Commercial Motor Truck Co., Plymouth, O., were described in these pages and an allusion was made to the peculiar style of two-speed transmission used, but which it was impossible to illustrate at that time. Since then an illustration showing this transmission has been received and appears herewith. For the benefit of those who did not read the description of the Plymouth cars it will suffice to state that they are made with a four-cylinder engine mounted under the bonnet and that amidships is a friction transmission system, comprising a couple of opposing friction disks on the propeller shaft, between which disks are two aligned cross shafts, each carrying a friction wheel adapted to contact with the forward or rear friction disk. On the outer end of one cross shaft is a sprocket for side chain drive, but on the outer end of the other cross shaft is a spur gear meshing with another spur gear on a short shaft carrying the chain sprocket, the spur gears being introduced to give the same direction of chain drive on each side. Instead of these side chains driving direct to sprockets on the rear wheels, as generally done, the company drives to a countershaft, A, located directly above the back

axle. On the ends of this countershaft are the chain sprockets, B, and near its center are two sliding pinions, C and D, and the former in mesh with a smaller spur gear, F, also rigid on the axle. The four pinions, C, D, E and F, constitute a two-speed gear, in that driving from the countershaft, A, through gears C and F gives a high speed and through gears D and E a low speed. Taking this two-speed gearset in conjunction with the friction system carried amidships of the car and you have in reality two transmission

systems, by means of which any desired speed variation either forward or reverse is possible. When driving through gears C and F gear D is slid out of mesh with gear E, and when driving on slow speed through gears D and E gear C is moved out of mesh with gear F. A peculiarity of the chain drive is the placing of the chains inside of the side members of the frame. Because of this, and carrying the countershaft above the rear axle, the car when viewed from the side has not the appearance of a chain-driven machine, the chains being hidden and consequently well protected from dust or mud. The arrangements for changing the speeds by means of the friction set and also by the two-speed spur gear system are controlled readily from the driver's seat.

## TIRE CHAIN FOR SOLIDS

J. A. Swinehart, president of the Swinehart Clineher Tire & Rubber Co., Akron, O., is receiving the congratulations of his friends on a new invention, which is associated with solid rubber tires used on commercial wagons or trucks. As the illustration on this page shows, it consists of embedding a closely linked chain in the center of the tire tread, the tire being formed with a groove to receive the chain, which is drawn tightly upon the rubber. The depth of the groove is not too great to allow of the chain contacting with the road surface, thereby preventing side slipping or skidding, or a circumferential slip. Preventing the circumferential slip means an increase of adhesion between the wheel and road, which is equivalent to an increase in the power of the vehicle. Still another claimed advantage of the chain invention is in case of tires that have broken loose at the base and have partly pulled away from it. In this case, or when a tire is practically worn out, additional life is



SWINEHART TIRE WITH BINDING CHAIN



gained and the old worn tire greatly rejuvenated. The patent remains in the possession of the Swinehart company and it is expected this concern will grant a license to other manufacturers to use the same device in connection with their tires.

### PHILADELPHIA'S DILEMMA

It does seem as if the troubles of the Philadelphia Auto Transit Co. never would end. Just when everything seemed favorable—the ordinance empowering it to operate its vehicles having successfully run the gauntlet of both branches of the city council—Mayor Reyburn, who had on one occasion at least distinctly stated that he favored some such scheme of adding to the city's none-too-good transportation facilities, astounded everybody with a veto. The reason his honor gave for his action was that the ordinance was "too general." It should be stated that the new bill was drawn up on lines suggested by the city solicitor, whose criticism that the original draft was "not general enough" induced those who were engineering it through the mazes of the municipal legislature to make the necessary changes. It is evident, however, that the promoters have failed to strike the happy mean between the two extremes which would have rendered the measure innocuous in the eyes of Philadelphia's chief magistrate. In other words, they are "between the devil and the deep sea."

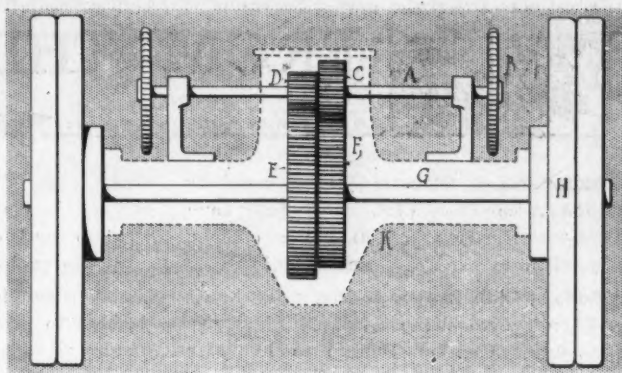
The transit company officials are now fighting mad, and have announced that on July 15 they will put in operation twenty buses on Broad and Diamond streets, from City Hall to Fairmount park, under the old ordinance of 1893, which calls for a license fee of \$200 for each vehicle. The company last year paid \$4,000 into the city treasury for this purpose, but were headed off from beginning operations by a phantom concern called the People's Vehicle Co., which caused an ordinance to be introduced into the council granting it a 25-year franchise to operate self-propelled passenger vehicles on nearly every main street of the city. It is insinuated that this specter concern was merely a club to "mace" the Auto Transit people. At least no tangible evidence of an intention or a desire on the part of the People's company to build or buy vehicles has as yet been discovered.

With two ordinances before them the councils turned down both. Then the Auto Transit people had the city solicitor frame up an ordinance and this it was that the mayor vetoed. Now the mayor, who evidently sees that he has erred, has intimated that he would not feel hurt if councils passed the ordi-

nance over his veto. He defends his course, however, by asserting that the buses which the Auto Transit Co. proposes putting on its line are "ugly, double-decked, hump-backed things"; that the city streets are too crowded anyhow. The big \$100,000 power house and garage which the company is now erecting at Thirty-first and Dauphin streets is rapidly nearing completion. It is an assured fact that once the system is in operation it will prove a paying investment. The citizens desire the system and doubtless will soon secure it.

### FROM ICE TO TROPICS

The Rapid Motor Vehicle Co., Pontiac, Mich., is building three large additions to its already comprehensive factory devoted exclusively to the manufacture of commercial cars. These additions will double the company's output. An 1100-square foot exhibit of Rapid machines, including delivery wagons, buses and sight-seeing cars, is completed at the Jamestown exposition and the company is prepared to make demonstrations. Besides selling throughout the home market the Rapid company has crossed north into Canada, where Joseph Maw & Co., Winnipeg, Manitoba, are handling the machines. As showing the wide field these cars are sold in is the fact that Walter Waldin, of Miami, Fla., and the Calgary Garage Co., Calgary, Man.—one near the most southerly point of the continent and the other well to the north—sell them. The former has used his machine daily under full load, 1 ton, making round trips of 14 miles. The Calgary Garage Co. with its 1-ton wagon left Calgary on a Sunday morning in April this year on a 130-mile trip. The roads for 10 miles were perfect, making the load of six passengers and baggage of little consequence.



PLYMOUTH TWO-SPEED GEARSET ABOVE REAR AXLE

For the remainder of the out trip the roads were very muddy, several times the truck traveling up to the hubs in mud. From 4 to 10 o'clock the following Monday the road trip led through a blinding snowstorm, necessitating using  $\frac{5}{8}$ -inch rope on the rear wheels to prevent slipping and skidding. The trip was completed by 6 o'clock and during the last portion of it, on account of lack of oil, all oil feeds except those to the cylinders were stopped. Before the completion of the run the driver was compelled to draw oil from the crankcase for the use of the cylinders. On the latter portion of the route the truck climbed many steep hills.

### FRENCH TRIALS STRENUOUS

There started in France on May 22 the most comprehensive test of commercial vehicles that has so far been conducted. It continued until June 10, during which time all of the vehicles were compelled to go from 80 to 100 miles per day over variable county roads carrying their scheduled load. Of the sixty vehicles starting but few so far have been reported as falling out, the test resulting into one of driver endurance and tire longevity. In general the motor and gearsets have stood up marvelously, giving no trouble, but drivers have fallen by the wayside. The rules required one driver to guide his machine the entire distance. Besides driver trouble was that of tires. Most of the machines used single or dual rubber tires, which stood well for the first few days, but soon evidenced distress under the fast pace set by many of the drivers, who, effervescing with the French speed mania, traveled at a speed more suitable for pleasure cars.

The Cohendet, the only cars carrying smooth steel tires, performed wonderfully, due, no doubt, to their robust construction, which is competent to withstand the hardest usage. Brillie cars fitted with spring wheels showed up poorly, but the maker remains content with his experience.



PREMIER TRUCK CARRYING BASEBALL TEAM



## FROM THE FOUR WINDS



**Motorists as Officers**—Eleven members of the Automobile Club of Buffalo have been sworn in as special police officers, who will compose a vigilant committee.

**Buffalo Club Growing**—Plans are being made to increase the membership of the Automobile Club of Buffalo to 1,000 by August 1. Ninety-five motorists have recently applied for membership. Those who now belong to the organization number 806.

**Would Drench Scorchers**—The city trustees of San Rafael, Cal., are said to be seriously considering turning the fire hose on scorchers. They would station men in the downtown streets and any car traveling faster than 10 miles an hour would be drenched with water, according to the plan.

**Rowe Trophy Design**—Dr. H. M. Rowe, president of the Automobile Club of Maryland has decided upon the design for the trophy which he will present to the winner of the 2-day run to Frederick and Hagerstown, June 15 and 16. There will be a woman's figure holding a wheel. In her other hand will be a scroll, on which will be engraved the name of the successful driver.

**Do Not Want to Stop**—Buffalo motorists are opposed to the ordinance proposed by Commissioner of Public Works Ward, which would compel a motor car to come to a full stop before passing a standing trolley car. According to the opinion of Corporation Counsel Desbecker, of Buffalo, any local legislation involved in the proposed ordinance is prevented by the New York state motor vehicle law.

**Car Mows Grass**—Colonel Webb Hayes, of Fremont, O., recently struck upon a rather novel use to which he has been putting his car on the famous old homestead of ex-President Hayes. Instead of using a large work horse to mow the lawn, he uses his two-cylinder Reo with a 36-inch lawn mower. His car also furnishes the power for a two-horse scraper and a two-horse iron-wheeled wagon to haul rubish, brush, etc., in. When doing the lawn stunts he removes the detachable rear seat in his car.

**Will Have Another Climb**—The Automobile Club of Bridgeport, which held a successful climb up Sport hill, Bridgeport, Conn., Decoration day, plans to have a similar contest Labor day. The club also awarded the Yale cup to R. D. Crawford, of New York and Saugatuck, who drove a six-cylinder Stevens-Duryea Decoration day, the award being for the best amateur driver. Crawford will put up the trophy for a perpetual challenge cup to be contested on Sport hill. Other Decoration day cups were awarded to the Maxwell in class 1, the Reo in class 2, the Pope-Hartford in

class 3, the Simplex in class 4 and the Stanley in class 5. The motor cycle cup went to the Indian.

**To Put Up More Signs**—At a meeting of the Automobile Club of Syracuse it was decided to place 100 additional route and danger signs and to start a campaign for the improvement of the main highway across the state east of Fayetteville. Forty-three new members have been added to the club.

**Work on Roads**—Eighteen cars carrying sixty-three people turned out for road mending day at Santa Barbara, Cal., where the automobile club gave a practical demonstration of the care that should be given the highways. Bumps were removed and holes filled and the monotony of the work was varied by a picnic.

**New Thomas Plant**—A recent photograph shows how the new plant of the E. R. Thomas Detroit Co. will look when it is completed. The plant, which has two city blocks frontage on Jefferson avenue, is well under way. The construction is all of reinforced concrete and the main building now is up to the second story. It is expected to build the entire plant and have the machinery running by September.

**Will Entertain Elks**—At the last meeting of the Quaker City Motor Club, of Philadelphia, J. R. Potter, C. E. Shreve and A. T. James were appointed a committee to confer with a similar committee of local Elks regarding a tour to be provided for the entertainment of visiting Elks on Sunday, July 14. The president of the club, Charles J. Swain, has been elected a director of the Pennsylvania Motor Federation.

**Owns Many Cars**—The nizam of Hyderabad, who rules over a state in India extending over 97,000 miles, has in his garage five 40-horsepower six-cylinder Napiers, one 55-horsepower four-cylinder Daimler, two 30-horsepower Brasiers, one 30-horsepower de Dietrich, one 30-horsepower Argyll, two 24-horsepower Fiats, four 20-horsepower Brasiers, one 18-20-horsepower Hotchkiss, one 18-horsepower Napier, one 12-16-horsepower Fiat and a luggage car.

**Kokomo Gives Up Field Day**—Defeated in their efforts to gain permission for speed tests from residents of Walnut street, the only asphalt pavement in the city, promoters of the July 4 motor day at Kokomo have given up the project. It was planned to have both daylight and night parades, endurance contests and several racing events. Walnut street residents, however, declared that motor racing on the city streets was dangerous and that if it were attempted, prosecutions would follow. The promoters speedily gave up

the plan, but say they will try to have some sort of a celebration on the occasion of the visit of Glidden tourists in Kokomo.

**New Job for Tucker**—A. B. Tucker, former secretary of the New York Motor Club, has been chosen assistant secretary of the new City and Country Motor Club of Greater New York, but retains his membership in the former organization.

**Of Interest to Tourists**—Through the efforts of the Automobile Club of Buffalo arrangements with the Canadian government for American tourists taking their cars into Canada have been made satisfactory. Those who desire to tour in Canada for the remainder of this year can do so by paying \$5 for the customs and bonding. The Ontario vehicle permit and markers cost \$4.

**Another French Fatality**—Marius Pin, who was to have driven a Darraq in the grand prix for M. Heriot, was killed while training over the course, the accident occurring at Bois de Dieu. Pin was passing a team which did not give him much of the road and he struck one of the horses and the side of the wagon. The gasoline tank hit him and forced him against the steering wheel, breaking his back. He died shortly after. Pin was regarded as one of the best drivers in France.

**Car As a Gardener**—Elizabethtown, Lancaster county, Pa., boasts a genius, E. E. Cable, who, finding the demands of his jewelry business too exacting to permit of his properly cultivating the garden back of his house, hitched up a harrow to his gasoline runabout and in less than an hour had the ground worked into shape for the reception of several bushels of seed potatoes. So quickly and easily did the combination work that Mr. Cable contemplates cultivating the tubers in the same manner, placing his rows at such a distance apart as to permit of the wheels of the car always running in the furrows.

**Motoring a College Course**—Washington university, the educational institution of St. Louis, is preparing to establish a chair of motoring in its manual training department. This distinctively new feature will be added to the curriculum when the school opens next September. It will be under the direction of Prof. Calvin M. Woodward, dean of the manual training school. In this department the students will be taught all there is to know about a motor car. In the workshops of the school the different parts of the motor car will be constructed. The students will be taught how to build gasoline engines, electric motors, and all of the parts that enter into the complete machine. In addition to that they will be given a thorough course of instruction on how to operate a car and



keep it in repair. The university will maintain an employment department to find places for its students and graduates during the summer months.

**Niagara Falls Aroused**—Signs warning motorists of the speed limits as defined by the ordinances of Niagara Falls are being put up there by Chief of Police Lyons of that city. Police Justice Banks of the Falls has promised to give his cooperation in the work of minimizing the danger caused by reckless motoring.

**Wisconsin Would Modify Law**—The lower house of the Wisconsin legislature has passed a bill which gives the motorist a right to pass a frightened horse or team if he thinks it necessary to avoid an accident. Also the bill repeals the section requiring a motorist to stop his engine on a signal from the driver of a horse or team. It is thought the senate will O. K. the measure.

**Barred from Cemetery**—Radical changes have been made in the rules governing Crown Hill cemetery, near Indianapolis, and gasoline motor cars and bicycles will no longer be allowed inside of the grounds. Incidentally, hereafter, horses must not be driven faster than a walk. Electrics will be allowed, but they must be run at low speed. It is said the beautiful asphalt drives winding among the graves have been an inviting place for speed tests, which will no longer be allowed. Guards stationed at the gates will refuse to allow gasoline cars to enter.

**Sentenced to Workhouse**—The first motor car owner to be sentenced to the workhouse in Indianapolis for reckless driving has just been given a fine of \$25 and costs and a sentence of 30 days by Judge Thomas A. Whallon, of that city. The victim is Everett Walker, whose car struck the rear wheels of a grocery wagon used as a pleasure vehicle and injured four persons who were riding in the wagon. Walker claimed he was not violating the speed law, but admitted the assault charge. He has furnished an appeal bond of \$250 and the case will be carried to the Marion county criminal court.

**Strict in New Jersey**—The Atlantic City Automobile Club's counsel are preparing to fight what they consider the first step in the usual campaign of overzealousness which the constables in the hinterland are wont to inaugurate with the opening of each successive season. Last week Charles Tomlinson, of Philadelphia, was compelled to leave his car at Magnolia, owing to a breakdown. Continuing to Atlantic City by rail, he wired the Philadelphia agents of the car to send a man down to fix the machine up temporarily and run it back to Philadelphia. When the mechanic arrived and attempted to run the car, after effecting a temporary repair, he was arrested for operating the car under a license not made out in his own name, Mr. Tomlinson having left his own credentials at Magnolia for the mechanic's use. The latter was fined

\$40, which Tomlinson has refused to pay, and the matter will be carried up to the state authorities at Trenton jointly by the owner and the Atlantic City club.

**To Stop Car Stealing**—The Minneapolis Automobile Club has offered a reward of \$100 for the conviction of any person stealing a machine owned by any member of the club. It also expressed its willingness to cooperate with the police department in suppressing the scorcher.

**Balk at Paying Toll**—There is now pending before the Connecticut state legislature a bill eliminating the toll bridges across the Connecticut river at Warehouse Point and Thompsonville. H. R. Coffin, of Windsor Locks, who represents his town in the house of representatives, is doing his utmost to bring about the enactment of this measure. He has occasion to cross the river many times during the day in his 45-horsepower Columbia touring car and he spends enough on tolls to keep him supplied with gasoline.

**Finishes European Tour**—Calvin S. Smith, of Chicago, has sailed for home after spending 3 months touring in Europe in which time he crossed the frontiers seven times and traveled 5,000 miles in a 60-horsepower Apperson without mishap or accident. Mr. Smith intends driving from New York to Chicago and expects to be home June 25. In a letter to Motor Age, written just before sailing, Mr. Smith tells of the general hostility shown toward motorists and adds that the Americans traveling abroad are giving Germany a wide berth because of the tales of alleged persecution of motorists.

**Test for Air-Cooler**—Next Monday the Logan Blue Streak air-cooled semi-racer will start from Toledo, the idea being to run across the state to Portsmouth, a distance of 254 miles, the trip to be made without stopping the motor. In connection with this efficiency test the Logan people tell of an incident that occurred while one of the roadsters was being tried out on the mile track at Chillicothe. They say the car was equipped with a 20-24-horsepower Carrico engine, and developed a speed of 40 to 50 miles an hour without difficulty. At this test, however, it was found that after 7 or 8 miles at high speed the motor seemed to shake up, and an investigation showed that the current of air sent back by the fan was making the motor too cool and was condensing the

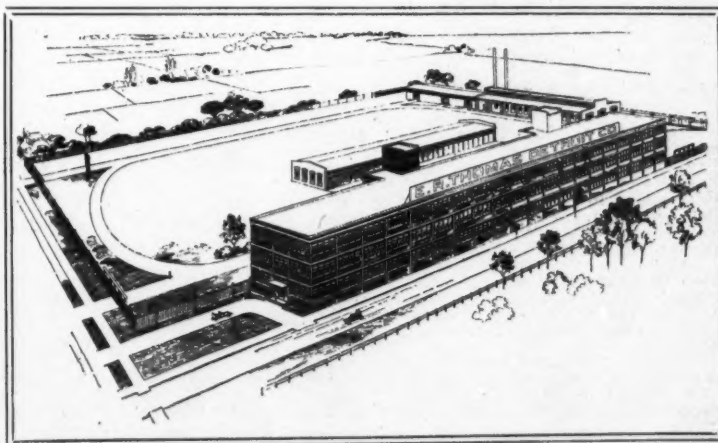
gasoline in the intake pipe. The fan was removed and the car was sent 48 miles without a fan, covering that distance inside of an hour, with the motor in perfect condition, it is claimed.

**Wants Missouri's First Tag**—Senator Methudy, of St. Louis, was the first applicant for a tag under the new law adopted by Missouri. The law goes into effect next Monday and up to June 1 there were 232 applicants for licenses. The tag money will be spent on good roads.

**U. S. M. R. A. Circuit**—The following circuit has been arranged by the United States Motor Racing Association, which will give only long-distance racing: June 21-22, Detroit, Mich.; June 28-29, St. Paul, Minn.; July 3-4, St. Louis, Mo.; July 6, Milwaukee, Wis.; July 10, Cleveland, O.; July 12-13, Chicago; July 19-20, Indianapolis, Ind.; July 26-27, Pittsburgh, Pa.; August 2-3, Providence, R. I.; August 9-10, Brighton Beach, N. Y.

**How Clement Was Killed**—The official report of Clement's accident confirms the first impressions. Clement took the 30 degrees turning too quickly and was running on the grass edges of the road. He failed to notice the heap of sand until too late and the machine was wrecked. The traces in the grass roadside show that the car was running on a perfectly regular curve when the accident occurred and therefore the accident cannot be attributed to the fault of the car but solely to an unfortunate error of judgment.

**Pathfinder in Denver**—Charles W. Thatcher, the pathfinder for most feasible transcontinental motor routes, spent a week in Denver and on the night of June 4 addressed the Colorado Automobile Club. His work was enthusiastically endorsed and he was pledged the moral support of the club in his coming campaign before congress for good roads. On Wednesday morning he was escorted to the city limits by a number of motor car owners in their cars and wished godspeed on his way to Kansas City. His direct work now is to lay out a road between these two cities, and he says he will shorten the distance 50 miles as compared with railroad travel.



HOW THE THOMAS DETROIT PLANT WILL LOOK



# LEGAL LIGHTS AND SIDE LIGHTS



## DIGEST OF ILLINOIS' LAW

Since the passage of the Humphrey bill by the Illinois legislature Motor Age has been asked so many questions regarding it that it herewith presents a synopsis of its salient features:

### LICENSES

The motor vehicle law includes automobiles, locomobiles and all other vehicles, but excepts motor bicycles, traction engines, road rollers, cars of electric and steam railways and other motor vehicles running only upon rails or tracks.

A car must be registered and a license taken out within 10 days from the time it comes into possession of its owner.

The registration fee is \$2 and application is made to the secretary of state at Springfield, Ill., on blanks which will be furnished by him upon application.

Upon registration and without further fee the secretary issues to the owner a seal of aluminum or other suitable metal, not exceeding 2 inches in diameter and circular in form. This seal must be attached to the car.

Exception is made in the matter of registering in the case of maker or dealer who keeps cars in stock and who does not rent them or drive them for his own private uses.

After a car has been registered the owner will have to buy his own tags, one for the front and the other for the rear.

Tags must consist of black numbers on a white background, the numbers to be of Arabic numerals not less than 4 inches in height and each stroke to be of a width not less than 1/2 inch. In addition there must be on the tag the letters "ILL," the letters to be at least 1 inch in height.

Each manufacturer and dealer doing business in the state shall register one vehicle in each class manufactured or dealt in by him and the number issued will do for any car of that type handled by him, until such car is sold or let for hire. By class is meant steam, gasoline and electric types.

In case of a car which has been registered by other than a manufacturer or dealer being sold vendor and purchaser must, within 10 days, file with the secretary of state a statement, together with a fee of 50 cents. Another and different number will be issued, the previous registration ceasing to apply to the motor vehicle sold. The new owner must pay the full fee, while the seller has the right to register any other car owned by him and have his old number.

Non-residents are not required to register so long as they carry their own state tags displayed according to the Illinois way.

It is not necessary to take out any license other than that of the state of Illinois, nor can the registered motorist be limited in the free use of any public street, avenue, road, turnpike, driveway, parkway or other public place at any time when the same is open to the use of persons having or using other vehicles. This does not apply, however, to any speedway created by any municipal corporation within the state.

A chauffeur, defined as a person operating a car for hire or a mechanic or employe, must be registered, the fee being \$1. He must also wear a badge conspicuously displayed, which will be furnished by the state. No provision is made for an examination as to the competency of a chauffeur.

### SPEED LIMITS

Speed allowed is as follows: One mile in 10 minutes turning a corner or at cross roads; 1 mile in 4 minutes when passing through the residence portion of a city or town; 1 mile in 6 minutes when going through the business part of cities or towns; elsewhere 1 mile in 3 minutes. The provision is made, though, that a reasonable speed must be maintained which shall have regard to the traffic and use of highways and so as not to endanger the life or limb or injure the property of any person. A motorist may be convicted of exceeding the speed limits if he drives at a 10-mile rate in a 20-mile district, provided traffic conditions make 10 miles an hour dangerous.

Municipal corporations cannot make laws or pass ordinances limiting the use or speed of motor vehicles except in case of machines for public hire.

Park commissioners have the right, though, to regulate the speed limit, which must not be lower than that fixed for other vehicles, and conspicuously placed signs must give these limits.

Motor vehicles may be excluded from cemeteries.

Driving a motor car or motor bicycle upon a public highway in a race will cost the drivers, upon conviction, each a sum not exceeding \$200.

### LIGHTS

Each car must carry two lighted lamps from sunset to 1 hour before sunrise which must show a white light at least 200 feet in the direction the car is going. In addition there must be at least one red light visible in the reverse direction, attached to the rear of the motor vehicle.

Upon the glass fronts of the two white lights must be the number of the license and in addition the letters "ILL," such numbers to be in separate Arabic numerals not less than 1 inch in height.

### USE OF HIGHWAYS

If a horse is about to become frightened by the approach of a motor car the driver must come to a full stop until the horse or horses shall have passed.

No one can drive a car without the owner's consent in the absence of the owner.

Reasonable warning must be given by the driver on approaching a pedestrian or a horse, and in case of any injury to a person or property on the public highways due to the presence or operation of a motor vehicle the driver must stop and upon request give his name and address, and if not the owner of the car, the name and address of such owner.

The bill does not curtail or abridge the right of any person to prosecute a civil action for damages.

Brakes and horns must be provided and it is against the law to allow the motor to run when the car is left on the road without an attendant.

### FINES

For a second violation of any section within 6 months fines may be doubled and the secretary of state can revoke the license for 30 days. A third violation within 6 months means a possible revocation of the license for 3 months. A suspended motorist can be fined \$200 and jailed for 30 days for driving during his suspension.

All fines shall be paid to the treasurer of the highway commission of the township or road district in which the offense is committed and shall be used in repairing and improving the roads.

### GRAFTING

The offer or acceptance of a bonus on the purchase of supplies or parts is forbidden and a conviction for this style of grafting means a fine not exceeding \$200 or imprisonment in the county jail for a period not exceeding 6 months, or both.

## AS GERMANY DOES IT

William Grossman, counsel for the City and Country Motor Club of New York, was one of the party in the lounging room of the One Hundred and Ninth street clubhouse the other night which was discussing police methods in the treatment of motorists. There was a strong belief on the part of those present that the system in New York of arresting men, taking them to court and subjecting them to a hearing by a magistrate and later on to a trial by a court of record was an injustice and a hardship. Someone pointed out that the Boston and Philadelphia methods by which the police simply took the number of the motorist and notified him to appear the next day was infinitely preferable and had all the desired effect of stopping unnecessary speeding. Mr. Grossman remarked that the system in Germany was much better than any used in this country.

"In Germany," he said, "the policeman takes the number of the machine which he believes to be going faster than the law allows, and registers this complaint with the magistrate, who hears him through and fines the culprit a stated sum for, the first, second or third offense, granting the

right to arrange to appear at a future hearing. The policeman then is given the paper containing the decision of the court and takes it to the alleged lawbreaker, whose name and address have been found through his number. The accused has the privilege of paying his fine off-hand to the policeman and receiving a receipt for it, if he does not wish to contest the case. If he thinks he can prove that the policeman was mistaken or has a valid excuse, he then can visit the magistrate and insist upon another hearing. Often in such cases the magistrate remits the fine, but oftener it is enforced. By this method the man arrested has the privilege of paying his fine without any of the annoyances of going to court or visiting a police station under compulsion, or giving a bail, or any other mortifying details. This also serves the purpose of doing away with graft on the part of the policeman, as he is not in a position to do anything for the motorist."

## NEGLIGENCE OF THIRD PERSON

In an action brought to recover damages for personal injuries sustained by a person in consequence of his being struck by a motor car while crossing the street of a city, the fact that the defendant was the owner of the machine and that the chauffeur in charge thereof was in his employ is sufficient to establish prima facie that the chauffeur was acting within the scope of his employment at the time; but if it further appears that at the time in question the chauffeur, in disobedience of such owner's express instructions, was using the car for his own pleasure, the defendant is not liable. In an Iowa case it was shown that the defendant, who dealt in motor cars, decorated one for use in a parade, and after it was over directed that such machine, while standing in front of his store, be taken inside and left there. His son, employed by him as a clerk, coming upon the machine where it stood in the street, invited a woman friend to ride, and while he was driving the machine a horse took fright and injured its driver. The court held that under the circumstances the owner of the machine was not liable, even conceding his son's negligence. The act of small boys in turning the starting lever of an electric truck, left standing in the public street by its operator, with the power off and the brake on, while making a delivery of goods to a customer, the act of the boys causing the truck to start down the street uncontrolled and to collide with a horse and wagon, was held by a New York court to be deemed the proximate cause of the collision and as the intervening act of third parties it exempts the owner of the truck from liability to the owner of the horse and wagon.